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PROCEEDINGS

OF THE

ACADEMY OF NATURAL SCIENCES

OF

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PROCEEDINGS

OF THE

ACADEMY OF NATURAL SCIENCES

OF PHILADELPHIA.

1864.

January 5th.

Vice-President VAUX in the Chair.

Twenty members present.

A letter was read from Thomas B. Wilson, M. D., Newark, Del., January 1, 1864, acknowledging his election as President of the Academy.

The following was presented for publication: "The Crania of Colymbus torquatus and C. Adamsii compared." By Elliott Coues, M. D.

January 12th.

Vice-President VAUX in the Chair.

Thirty members present.

The following were presented for publication:

"Description of a New Genus of the Family Melanidæ." "Description of Eleven New Species of Melanidæ," and "Description of Planorbis Newberryi." By Isaac Lea.

"Thoughts on the Influence of Ether in the Solar System," etc. By Alexander Wilcocks, M. D.

"Descriptions of New Polydesmidæ," and "Descriptions of New Iulidæ." By Dr. H. C. Wood, Jr.

On leave granted, Mr. Cassin presented the following preamble and resolutions, which were unanimously adopted:—

Whereas, our eminent and highly-esteemed associate and President, ISAAC LEA, LL. D., having declined being a candidate for re-election to the position of chief officer of this Academy, has retired therefrom:—

Resolved, That the Academy does hereby express its most grateful sense of the entire faithfulness, impartiality, and eminent ability with which Dr. Lea performed the duties of President during the lengthened term of his incumbency.

Resolved, That the thanks of this Academy be hereby tendered to Dr. Lea for his most valuable and important services in the capacity of President, and for his many other judicious and liberal favors and continued and successful exertions for the benefit of this Academy and for the advancement of the interests of Science in the United States.

January 19th.

Vice-President VAUX in the Chair.

Eighteen members present.

The following was presented for publication:—"Notes of Botanical Visits to the lower part of Delaware and the Eastern Shore of Maryland." By Wm. M. Canby.

January 26th.

Vice-President BRIDGES in the Chair.

Twenty-one members present.

On report of the respective committees, the following were ordered to be published:—

Description of a new Genus of the Family MELANIDÆ.

BY ISAAC LEA.

Genus MESESCHIZA.*

Testa fusiformis, imperforata. Apertura rhomboidea, infernè canaliculata. Labrum expansum, in medio excisum. Columella lævis, incurvata. Operculum corneum ad spiram pertinens.

When I described the genus *Trypanostoma*,† I mentioned the importance of eliminating as many species as possible from the enormously-extended genus *Melania*. The little shell which I now propose as a new genus has so distinct a character in the incision of the middle of the outer lip, as to mark perfectly its place in the *Melanidæ* of the United States. It differs entirely in the character of the cut from that in *Schizostoma*, which has, in all the many species I have seen, a more or less deep incision immediately under the suture. The living soft parts have not yet been observed. They may, when examined, prove to have some characteristics quite different from *Schizostoma*.

MESESCHIZA GROSVENORII.—Testâ lævi, fusiformi, tenui, obtusè conicâ, v
purpureâ vel vittatâ; spirâ obtusè conicâ; suturis leviter impressis; anfract
bus instar septenis, vix convexis; aperturâ magnâ, rhomboideâ, intus plerum
què vittatâ; labro acuto, in medio leviter exciso; columellâ parum incrassat
et contortâ.

---

* Μεση, σχιζη, central fissure.

† Journal of the Academy of Natural Sciences, vol. v. p. 268, and "Ob
tions," vol. ix. p. 90.

Operculum ovate, light-brown, rather thin, having several volutions, and with the polar point well removed from the left margin.

Hab.—Wabash River, Indiana, H. C. Grosvenor.

Remarks.—I have thirteen specimens of this remarkable shell. Eight of them have a well-defined though delicate notch on the edge at or near to the periphery of the last whorl. Five of the specimens have no notch, which probably arises in four of them from not being full grown, and in one from having the thin, delicate edge broken off. In all the specimens there is a light line under the sutures, and some have six or seven brown bands, which are distinctly seen on the inside. The channel at the base is small but well defined. In outline, this species reminds one of *Goniobasis Vauxiana* (nobis) and *Melania* (*Goniobasis*) *germana*, Anth. It is a thinner shell than either, and the notch in the lip removes it from that genus. The aperture is about one-half the length of the shell. I have great pleasure in naming this species after Mr. Grosvenor, to whom I am greatly indebted for many of our Western *Mollusca*.

Descriptions of eleven new Species of Indigenous MELANIDÆ.

BY ISAAC LEA.

Goniobasis Emeryensis.*—Testâ plicatâ, subfusiformi, subtenui, tenebroso-olivâ, evittatâ; spirâ obtusè conoideâ; suturis irregulariter impressis; anfractibus instar senis, planulatis, supernè plicatis; aperturâ grandiusculâ, subovatâ, intus cæruleo-albâ; labro acuto, leviter sinuoso; columellâ infernè parum incrassatâ et contortâ.

Operculum ovate, dark-brown, with polar point near to the base.

Hab.—Rocky Creek, head branch of Emery Run, E. Tennessee, Major S. S. Lyon, U. S. E.

Goniobasis umbonata.—Testâ nodulatâ, subfusiformi, subcrassâ, obsoletè vittatâ, tenebroso-olivâ; spirâ valdè obtusâ; suturis valdè impressis; anfractibus irregulariter umbonatis, subsuturis tumidis, ultimo pergrandi; aperturâ pergrandi, subellipticâ; labro acuto, leviter sinuoso; columellâ supernè incrassatâ, infernè subsinuosâ.

Hab.—Smith's Shoals, Cumberland River, E. Tennessee, Major S. S. Lyon, U. S. E.

Remarks.—This is the fourth species of a natural group which I have described, and which have a large ear-shaped aperture,—viz.: *Melania* (*Goniobasis*) *basalis*, *Midas*, *gibberosa* and now *umbonata*. If they be not entitled to a generic place, they may at least be considered a subgenus, for which I propose the name of *Eurycælon*, from Ευρυς, *amplus*, and Κοιλον, *cavitas*,—the aperture being larger than in the *Melanidæ* generally. All the species of *Eurycælon* have a callus on the columella above, but not below, as in *Lithasia*, and the base is more or less angular, which is not the case with *Anculosa*. Those which we have considered as varieties of *Anculosa prærosa*, Say, which have an angular base, properly belong, I think, to *Eurycælon* as well-also *Anthonyi*, Redfield, *turbinata*, and *tintinnabulum* (nobis), and some others. When the soft parts of the four species mentioned first shall be examined, they will, I think, be found to differ from *Goniobasis*, *Trypanostoma* and *Lithasia*, to which genera they seem nearest allied. The operculum of the only one I have seen, *gibberosa*,—is the same as *Goniobasis* and the *Melanidæ* generally.

---

* In my paper on New *Melanidæ* of the United States, published in the Proceedings of the Academy, in 1861, and more at large in the Journal, vol. v. and in my Observations, vol. ix. I used the names of *blanda* and *Vanuxemii* for two new *Goniobasi*. Having used both names before as *Melaniæ*, which now come under the genus *Goniobasis*, I propose to change *blanda* into *veres* and *Vanuxemii* into *Prestoniana*, the former, *Vanuxemii*, having been found at Col. Preston's salt works in Western Virginia.

Mr. Reeve having published in his "Conchologia Iconica" *Melania* (*Goniobasis*) *Canbyi* (nobis) under the name of "*Etowahensis*, Lea," prior to my publication of it, the name of *Etowahensis* must be retained for that species. I therefore transfer the name of *Canbyi* to the species which I subsequently published as *Etowahensis* in the Jour. Acad. Nat. Sci., vol. v. and "Observations," vol. ix. pl. 37, fig. 138.

Goniobasis Albanyensis.—Testâ granulatâ, conicâ, subtenui, luteo-olivaceâ; spirâ subelevatâ; suturis irregulariter impressis; anfractibus instar senis, planulatis, supernè interdum plicatis, infernè striatis; aperturâ grandiusculâ, ovatâ, intus albidâ; labro acuto, vix sinuoso; columellâ aliquantò inflectâ et contortâ.

Operculum subrotund, light-brown, very thin, polar point on the left, near the middle.

Hab.—Near Albany and Blue Springs, Baker County, Georgia, Rev. G. White.

Goniobasis viridostriatis.—Testâ virido-striatâ, fusiformi, subtenui, luteo-olivaceâ; spirâ obtuso-conicâ; suturis irregulariter impressis; anfractibus instar quinis, convexiusculis, supernè granulatis, infernè striatis; aperturâ parviusculâ, ovatâ, intus vittatâ; labro acuto, vix sinuoso; columellâ aliquantò inflectâ et contortâ.

Operculum subrotund, very small, very thin, light-brown, with the polar point on the left near the middle.

Hab.—Flint River, Georgia, Bishop Elliott and Mr. Gesner.

Trypanostoma subrobustum.—Testâ lævi, pyramidatâ, tenebroso-corneâ, crassâ; spirâ pyramidatâ, elevatâ; suturis impressis; anfractibus instar novenis, planulatis; aperturâ parvâ, rhomboideâ; labro acuto, valdè sinuoso; columellâ incrassatâ et valdè contortâ.

Operculum ovate, dark-brown, with polar point near the base of the left side.

Hab.—Holston River at Knoxville, E. Tennessee, Major S. S. Lyon, U. S. E.

Trypanostoma Roanense.—Testâ lævi, obtuso-conicâ, crassâ, vittatâ vel evittata; spirâ obtusâ; suturis impressis; anfractibus planulatis, subsuturis tumidis; aperturâ parviusculâ, rhomboideâ; labro acuto, sinuoso; columellâ albidâ, incrassatâ et valdè contortâ.

Hab.—Roane County, E. Tennessee, Major S. S. Lyon, U. S. E.

Trypanostoma Lesleyi.—Testâ tuberculatâ, pyramidatâ, tenebroso-corneâ; spirâ elevatâ; suturis irregulariter impressis; anfractibus instar octonis, subimpressis; aperturâ parviusculâ, rhomboideâ, intus albidâ, interdum vittatâ; labro acuto, valdè sinuoso; columellâ incrassatâ.

Operculum ovate, dark-brown, rather thin, with the polar point near the base.

Hab.—East Tennessee, Prof. Troost. Smith's Shoals, Cumberland River, E. Tennessee, Major S. S. Lyon, U. S. E.; and Pulaski Co., Kentucky, Joseph Lesley, C. E.

Trypanostoma affine.—Testâ canaliculatâ, pyramidatâ, corneâ; spirâ valdè elevatâ; suturis irregulariter impressis; anfractibus instar novenis, canaliculatis, suprâ planulatis; aperturâ rhomboideâ, intus albidâ vel vittatâ; labro acuto, sigmoideo; columellâ incrassatâ et valdè contortâ.

Hab.—Smith's Shoals, Cumberland River, E. Tennessee, Major S. S. Lyon, U. S. E.

Trypanostoma cylindraceum.—Testâ lævi, cylindraceâ, subcrassâ, vittatâ vel evittatâ; spirâ subelevatâ; suturis irregulariter impressis; anfractibus planulatis, leviter impressis, subsuturis tumidis; aperturâ parviusculâ, rhomboideâ; labro acuto, aliquantò sinuoso; columellâ incrassatâ, incurvatâ et contortâ.

Hab.—Roane County, E. Tennessee, Major S. S. Lyon, U. S. E.

Trypanostoma carinatum.—Testâ carinatâ, acuto-conicâ, rufo-corneâ, tenui diaphanâ; spirâ acuto-conicâ, mucronatâ; suturis valdè impressis; anfractibus instar novenis, carinatis, supernè striatis; aperturâ parviusculâ, rhomboideâ; labro acuto, sinuoso; columellâ aliquantò incrassatâ et contortâ.

Hab.—Bull Run, tributary to Clinch River, E. Tennessee, Major S. S. Lyon, U. S. E.

STREPHOBASIS LYONII.—Testâ lævi, subcylindraceâ, crassâ, tenebroso-corneâ vel olivâ, rarò vittatâ; spirâ obtuso-conicâ; suturis impressis; anfractibus octonis, convexiusculis; aperturâ subconstrictâ, rhomboideâ, intus albidâ, rarò vittatâ; labro acuto, aliquantò sinuoso; columellâ infernè incrassatâ, ad basim canaliculatâ et retrorsâ.

Hab.—Holston River at Knoxville, E. Tennessee, Major S. S. Lyon, U. S. E.

Description of and Remarks on PLANORBIS NEWBERRYI.

BY ISAAC LEA.

PLANORBIS NEWBERRYI.—Testâ pallido-corneâ; depresso-turritâ, minutissimè striatâ, supernè et infernè acuto-carinatâ, latè et profunditè umbilicatâ; anfractibus quinis, supernè planulatis; aperturâ magnâ, pallido-corneâ, subtriangulari.

Shell pale horn-color, slightly turrited, very finely striate, sharply carinate above and below, widely and deeply umbilicate, whorls five, flattened above; aperture large, pale horn-color and subtriangular.

Planorbis Newberryi, Lea, Proc. Acad. Nat. Sci., 1858, p. 41.

Hab.—Klamath Lake and Canoe Creek, California, J. S. Newberry, M. D.

My cabinet and cabinets of Smithsonian Institution and Dr. Newberry.

Diam. ·55, Length ·42 of an inch.

Remarks.—This is a very remarkable shell, and I have placed it among the *Planorbes* until the soft parts may be observed in a living state; they may be found to differ from the true *Planorbes.** Some specimens preserved in alcohol have been carefully examined, but the parts are so rigid that it could not be satisfactorily done. The tentacula do not, however, seem to be so long as is usual in the *Planorbes.* The epidermis is very thin on the upper part of the whorls, and the striæ there are backwards in curves, and on the lower part slightly forwards. The upper carina forms an acute angle, the edge being cord-like; the lower one is still more acute. In most of the specimens there are two obscure carinations on the whorls between the acute ones. The umbilical region is very remarkable, the perforation extending to the apex of the slightly elevated spire, the apex itself being frequently wanting, owing to corrosion occasioned by the attacks of some small enemy eating into the substance of the hard part. The upper angle of the whorls is elevated slightly above the plane of the whorls, thus forming a Babylonic appearance. This gives the shell the appearance of some forms of the *Trochi.*

This very curious and interesting species is among the *Mollusca* brought by J. S. Newberry, M. D., attached to the Pacific Railroad Survey under the command of Lieut. R. S. Williamson, U. S. A., and I have great pleasure in dedicating it to Dr. Newberry, who has done so much to elucidate the Natural History of California and Oregon, when on these expeditions so creditable to the Government.

---

* Provisionally it may be called *Megasystropha*, from Μεγα, magnus, and συστροφὴ, vortex,—the umbilicus being large and vortex like.

Descriptions of New Species of NORTH AMERICAN POLYDESMIDÆ.

BY DR. H. C. WOOD, JR.

Genus POLYDESMUS.

Subgenus FONTARIA.

P. TRIMACULATUS.

P. saturate rubro-brunneus; scutis postice fulvo trimaculatis, corrugatis; antennis ultimis pilosis; pedibus dilute fulvis; appendicibus genitalibus masculis maximis, crassibus, ultimis obtuse rotundatis, spina terminali gracillima, enormiter convoluta.

The color of this species is a dark reddish brown. Each scutum has on the posterior portion of its lateral lamina a bright yellow or orange spot, and a blotch of the same tint on the median portion of its posterior border. Occasionally this is so prolonged as almost to give the idea of a continuous transverse band. The first scutum has two central markings, situated the one on its anterior, and the other on its posterior border. These are so shaped and joined together as to suggest the idea of an hour-glass. The anal scutum is triangular and somewhat elongate. It is yellow, but has a dark spot on each side, and its truncate apex is tipped with brown. The head is chestnut brown. Its vertex is deeply canaliculate, and its inferior lip distinctly emarginate, and fringed with hairs. The antennæ are light brown, slender, and not at all clavate. The feet are light yellow, with their distal portion somewhat pilose and occasionally tipped with brown. The male genital appendages are very large and robust. Their terminal spine is simple, long, slender, and irregularly bent upon itself. They are also furnished with a small nearly straight spinule, placed proximally as to the terminal. The female genitals are very short, thick and bulbous. On one side of each there is an opening, with two projecting plates separated from one another by a linear orifice. I have seen a male and female, which were collected by Mr. E. D. Cope in Susquehanna Co., Pennsylvania. They are about two inches long.

P. CORRUGATUS.

P. atro-castaneus, scutis fulvo postice marginatis; laminis lateralibus fulvis, latissimis, angulis anticis rotundatis, posticis modice acutis; scuto anale triangulare, elongato, postico fulvo, apice truncato; appendicibus genitalibus masculis maximis, spinulo laterale robusto subbreve vix curvato armatis; spina terminale maxima, robusta, compressa, tortuosa, spinulo basale armata.

The color of the perfect animal is a chestnut black, rarely reddish chestnut, with a moderately broad margin of fulvous [in alcoholic specimens] on each scutum. This band may be red during life. The scutæ beautifully polished to the naked eye, the microscope shows to be obsoletely wrinkled. Very many of these wrinkles are longitudinal. The head is of the same color as the body; medianly it is distinctly sulcate; inferiorly it is broadly and rather deeply emarginate. The scutal side plates are fulvous above and below. Their anterior angles are rounded, their posterior more or less acute, and in the hinder ones prolonged. The under surface of the body is of a light yellow. The male genital appendages are very large and robust. They have a short, slightly crooked spinule attached and lying close to their side. The terminal spine is irregularly spiral, and has near its base a curved spinule. At the point of its origin is a tuft of bristly hairs. Each female genital appendage is chiefly composed of a short, almost globular, process, in one side of which there exists a large opening. This process is scarcely at all pilose. Through the side opening projects a pair of large, thick plates, fitting together somewhat in the manner of bivalve shells. These nearly equal in height the main process. The spine on the second joint of the feet is robust, but acute. The whole animal is about one and a half inches in length.

Hab.—Michigan; Prof. Miles. Trenton Falls, New York; Mus. Comp. Zoology, D. Mack.

P. BIFIDUS.

P. rubro castaneus, segmentis et antice et postice late fulvo-marginatis, laminis lateralibus dilute fulvis; scuto anale triangulare, apice truncato et decurvato; appendicibus genitalibus masculis elongatis, pilosis; spina terminale gracillima, proxima cylindracea, ultima bifida et nonnihil abrupte curvata, spinulo basale gracillimo parvo armata.

All of my specimens have been preserved for a length of time in alcohol, so that the description of color is not as accurate as it should be. The anterior aspect of the head is much lighter than the vertex, which is medianly strongly canaliculate. The antennæ are dilute fulvous, are rather longer than in *P. virginiensis*, and are distally, sparsely and shortly pilose. The spinules on the distal ends of the first and second joints of the long and slender feet are robust, but are often obsolete anteriorly. The terminal scutum has several punctæ closely resembling pores. The preanal scale is triangular; it has two little elevations surmounted by a punctum. The male genital appendages are elongate. Their terminal spine is very slender and cylindrical in its proximal portion; distally it is bifid and strongly curved. It is ornated with a very slender curved basal spinule.

Hab.—Georgia; Museum of Comp. Zoology, Dr. LeConte. Texas; Collection of Smithsonian, G. Wurdeman.

P. CRASSICUTIS.

P. maximus, robustus; scutis enormiter subrude punctatis; appendicibus genitalibus masculis, singula spinis quatuor armata; duobus magnis, parvis duobus.

The color of all the specimens is light testaceous; with, in many, a dark dorsal line. It is very possible that the alcohol, in which they have been long preserved, may have destroyed the original color. The animal is very large and robust, and has its outer armor and side plates very heavy. The head on its upper surface has a distinct median furrow, and on its lower a broadly lineal, oblique depression on each side. The inferior margin is rather broadly and deeply emarginate. The lateral lamina are rather short. The female genital appendages are a pair of small, pyramidal, pilose bodies, whose apices are split into three or four very minute mameloid processes. The male organs are large, and distally very hairy. They are each armed with two large and two small spines. The longer and more slender of the former at its proximal portion is bent rather abruptly at right angles to itself, but is nearly straight afterwards. The more robust is pretty straight, save at its distal extremity, where it is abruptly bent at right angles to itself. It is armed with several very slender spinules, and has one edge distantly and obsoletely denticulate. Of the smaller spines, one is short and blunt; the other much longer, sharp, slender and falciform. The last scutum is triangular, and has its apex truncate and very slightly decurvate. The preanal scale is semiorbicular.

Length, 2 to 3 inches.

Hab.—Mississippi. Museum of Smithsonian.

Subgenus POLYDESMUS.

P. HISPIDIPES.

P. saturate olivaceo-brunneus, immaculatus; dorso nonnihil convexo; scuto anale triangulare longe pilose, apice truncato et decurvato; pedibus hispidis; appendicibus masculis genitalibus brevibus, robustis, spina terminale modica, ultima abrupte curvata, dense pilosa.

The color is darker than in *P. erythropygus*. The side plates are rather short, with their edges much thickened. The head has its vertex strongly canaliculate. Its anterior face is marked with two small punctiform impressions. The lower border is not very strongly emarginate, and is set with a fringe of short thick hairs. The antennæ are mostly dark colored, scarcely at all clavate and coarsely pubescent. The feet are rough, with closely set, stiff hairs. The anal scutum is prolonged posteriorly, so as to come almost to a blunt point. The genital appendages in the male are short and thick. Their terminal spine is slightly curved at its base, thence is nearly straight, save at its distal extremity, where it is abruptly curved, becoming nearly horizontal. It is beset with very numerous long hairs. We have examined them in eighteen specimens, and found them to agree perfectly. The female genital appendages consist of a pair of short, conoidal, very pilose processes, which have an opening along their inner edge.

Length one inch and an eighth.

Hab.—Illinois. Smithsonian Coll. R. Kennicott.

Var.? P. laete castaneus, fulvo vel rubro maculatus, linea nigra dorsali ornatus; laminis lateralibus marginibus rubris vel fulvis.

This is possibly a distinct species, but as I have seen but a very few individuals, and the male genital appendages do not differ from those of *P. hispidipes*, I prefer not risking a synonym. Whether the spots are yellowish or red in the living animal, the length of time our individuals have been preserved in alcohol precludes me from deciding.

The spots are sometimes arranged regularly—two large ones on each side of the mesial line, and a row of small ones on the posterior border.

Hab.—Illinois. Smithsonian Coll. R. Kennicott.

Subgenus STENONIA.

P. CERASINUS.

P. dilute cerasinus; dorso complanato; antennis modicis pubescentibus, nonnihil clavatis, nonnihil brevibus; scutis squamis obsoletis ornatis, marginibus lateralibus serratis; appendici genitali masculæ spina terminale lata, oblique truncata, utrinque processu longo setaceo curvato instructa.

The head has the median furrow on its vertex illy pronounced. The anterior face is sparsely pilose, and has its lower margin broadly but shallowly emarginate. The scuta have a double row of scales, obsolete but otherwise similar to those of the following species. Sometimes these are entirely lost. The lateral margins of the side plates are rounded slightly and minutely serrulate. They seldom have more than three serratures on each side. The terminal scutum is triangular, with its obtuse apex bent downwards. It is sparsely pilose. The legs are quite hairy, and light colored. Their second joint is tumid. The genital appendages in the male are peculiar. The terminal spines are broad and short, and superiorly very obliquely truncated, with two small hamular processes. On each side a long, seta-like process springs from the base. The outer, much the longer of the two, throws an arch entirely over the short spines. The inner is straighter. They both have one or two thorn-like excrescences.

Hab.—Oregon. Museum of Smithsonian Institution.

Subgenus STRONGYLOSOMA.

P. ERUCA.

P. brunneus? robustus; antennis brevibus, pilosis, haud clavatis; scutis subrude punctatis; pedibus parvis, gracillibus, modice hirsutis.

Judging from our badly preserved alcoholic specimens, the color of this species is reddish brown, with the side plates a lighter color. The body is very robust. The head has a median furrow on its vertex, and its lower border emarginate. The side plates have but the posterior angles, which are acute.

The scuta appear to have a narrow edging of black posteriorly. The terminal scutum is subtriangular, very prolonged and very thick posteriorly. We have never had an opportunity of examining the male genital organs. Those of the female are very pilose, and are formed of two portions. They are contracted at their bases, and expanded above, somewhat as a reversed flattened cone. The basal piece is thicker, and less hairy than the other. The distal piece is set into it, and has along the free extremity an opening.

Hab.—Oregon. Museum of the Smithsonian.

Subgenus LEPTODESMUS.

P. PLACIDUS.

P. olivaceo-brunneus, scutis plerumque nigro vittatis; laminis lateralibus parvis, dilute brunneis; pedibus saturate olivaceis; sternis dilute brunneis; appendicibus genitalibus masculis, valde elongatis; spina terminale magna, in spiram ducta et spinulo basali longissimo falciforme et altero laterale breve robusto instructa, margine partim acute serrato, partim integro.

The head is dark colored. Besides its median furrow, it is also ornamented with a pair of sometimes illy pronounced punctæ on each side of the vertex. Its inferior border is rather broadly emarginate. The antennæ are elongate, dark brown, and tipped with black. The anal scutum agrees with the others in color. It is triangular, with its apex truncate, obscurely emarginate and decurvate. The male genital appendages are strikingly elongate. The terminal spine is nearly black. It is bent spirally on itself, but after performing a little more than an entire turn is nearly horizontal for some length. It is flattened, with its superior surface somewhat umbonate. It ends in a thick, blunt, spine-like process. The proximal portion of the anterior margin is acutely serrate. From the edge projects a short thorn-like spinule, and from the base a long, slender falciform spine.

Length, one and a quarter inches.

Hab.—Michigan. Prof. Miles.

P. FLORIDUS, var.?

P. atro-castaneus; scutis postice rubro-aurantiaco marginatis; laminis lateralibus parvis, laete rubro-aurantiacis; appendicibus genitalibus, masculis P. placidi illis similibus.

The head is lighter colored than the body. It is medianly canaliculate, with a pair of punctations on each side of its vertex. Its inferior border is broadly emarginate. The antennæ are rather long and slender, very slightly clavate, light brown, and distally tipped with black. The scuta are smooth, beautifully polished, and not corrugate. The side plates are distant, quite small, and nearly horizontal. Their anterior angles are rounded. The anal scutum is prolonged, and is sometimes wholly, sometimes partially orange. It is triangular, with its apex truncate and slightly emarginate, and its sides curved. It projects posteriorly, and is bent downwards. The feet are cylindrical, yellow, and somewhat pilose. The male genital appendages resemble those of *P. placidus*, except in color. They are yellowish. Those of the female consist of a pair of short, blunt processes. Each of these has a basal portion into which is set a short somewhat flattened body, with an obscure linear opening traversing its distal surface. From the junction of these two parts springs a heavy fringe of long, coarse hair. *P. floridus* is very possibly a distinct species from *P. placidus*. I have seen but a single individual of the latter. The general appearance of the two is so dissimilar, as to incline me to the belief of their distinctness. But they agree well as to their genitalia, and a suite of specimens might show their identity.

Length one and a quarter inches.

Hab.—Michigan. Prof. Miles.

P. HAYDENIANUS.

P. olivaceo-castaneus; antennis modicis, sparse pilosis, ultimis nigris; laminis lateralibus luteis; appendicibus genitalibus masculis hirsutis et processu lato breve et spinis duobus armatis; spina terminale modice robusta, valdo curvata.

Judging from an alcholic specimen, the color of this animal is an olive chestnut, with the side plates yellowish, and the posterior portions of the scuta much lighter than the anterior. The head is bright chestnut, and is ornamented with a median furrow on its vertex, and a pair of impressed dots on each side of its face. Its inferior border is medianly moderately emarginate. The margins of the side plates are somewhat thickened. The anal scutum is yellowish, small, subtriangular, and distinctly emarginate posteriorly. The feet are very slender, and are shortly pilose. The femora of the hinder ones are armed with a small spine on their distal extremity. The male genital appendages are small, and are hairy at the base. They are armed with a broad, obtuse, spinous process, and a slender curved spine besides the terminal. The latter is robust, and is bent with a double curve, that is anteriorly and laterally. I have dedicated this species to my friend, Dr. Hayden, whose name is inseparably connected with the far West.

Hab.—Oregon. Museum of the Smithsonian.

Descriptions of New Species of North American IULIDÆ.

BY DR. H. C. WOOD, JR.

Genus IULUS.

I. VENUSTUS.

I. rubro-castaneus, linea dorsale nigra et maculæ nigræ seriebus lateralibus (interdum obsoletis) ornatus; antennis longis, filiformibus, pilosis, haud clavatis; scutorum lateribus canaliculatis; segmentis 52; mucrone parvo.

The general color of this species is reddish chestnut; frequently the red predominates so much that the individual is really flesh-colored, but occasionally the chestnut overcomes the other tint. The dorsal stripe is generally very distinct, especially on the posterior portion of the scuta. The eyes are triangular, and are connected by a dark band, which is often rather obscure. The anterior cephalic aspect is long and narrow, with its sides converging inferiorly. Its inferior border is fringed with a double row of short, distant hairs, and is medianly deeply emarginate and 2—4 dentate. The scuta are ornamented, rarely with a white blotch on each side of the mesial line, but generally with two lateral black dots. The first scutum in the female has the anterior margin oblique as to the main axis of the body, and is prolonged laterally so as to form processes, mostly canaliculate, with a rounded border. In the male the anterior margin is at right angles to the axis of the body, and the lateral parallel to it, so that there are no processes. The male genital appendages consist of two main portions on each side. The outer and more conspicuous of these is formed of a thin, very irregular plate, from whose base springs a short, clavate, cylindrical, distally pilose process. The inner portion is composed of a long, very slender, almost setiform process, and a shorter straighter one. The former at its base is bent at right angles to itself; and distally it is somewhat spirally arched over the other.

The female genital appendages consist of two broad, robust, pilose processes, with a pair of very slender, almost filiform, feet like bodies, springing from their conjunction and equalling them in length. The major portion of each appendage is composed of a single plate. This is folded on itself, so as to constitute an irregular, flattened cylinder, which is open at its end, and along the outer edge. It presents on one aspect an unbroken, tolerably regular surface, but on the other is proximally abbreviated. Through the opening thus afforded projects a pair of subcircular, somewhat globose plates, fitting together much as the shells of a bivalve.

Length, 2 inches.

Hab.—Illinois. Smithsonian Institution. R. Kennicott.

In the same collection we have seen a male *Iulus* very closely resembling the former, but differing so much in its genital appendages, that it probably represents a distinct species. The outer of the two parts, forming each genital appendages, consists of a thin, flat, crooked, very irregular process, and a shorter, robust, pilose and strongly clavate one. The former, proximally, is quite broad, and narrows from the base, but distally is but at a right angle to itself, and is rapidly contracted, so as to terminate in a nearly cylindrical crooked point. The main process of the inner portion is somewhat cylindrical proximally, but is distally expanded. At first bent at a right angle to itself, it next has the swan-neck curve, and is then bent at an acute angle to itself to be straight the remainder of its length. At this angle there is a minute sharp spine. Shielded, as it were, by this process, there is another, very slender and acute.

I. PILOSISCUTA.

I. castaneo-brunneus maculae nigræ (interdum obsoletæ) seriebus lateralibus ornatus; antennis longe pubescentibus; capitis margine antico modice emarginato, denticulato; segmentis 58; mucrone parvissimo; scutis pilosis singulo punctæ sejunctæ serie impresso.

The color of this species is a chestnut brown, sometimes mottled with light brown. The anterior aspect is beautifully but irregularly areolated with the latter color. The antennæ are moderately long, and have their dark joints tipped with white. Their is a pair of coarse punctations on the vertex. Each scutum has a series of distinct punctations extending entirely around it; from these dots proceed little channels, obsolete on the fore-part of the body, but gradually becoming strongly pronounced. The anterior portion of the body is sparsely, but the posterior densely, pilose. The anal scales are very rough. We have never seen a male. Neither can we give a detailed account of the female genital appendages, but one portion of them consists of a pair of short, subcylindrical, rather robust and distally clavate processes.

Hab.—Susquehanna Co., Pennsylvania. E. D. Cope, Esq.

I. OREGONENSIS.

I. læte castaneus, albido-brunneo annulatus, et linea dorsale nigra et maculis nigræ seriebus lateralibus ornatus; antennis filiformibus, longis, pilosis, subclavatis; capitis margine antico valde emarginato, denticulato; segmentis 44—45; scutorum lateribus canaliculatis; mucrone parvo, robusto; squama preanali triangulare.

The color of this elegant species is a bright chestnut, ornamented with rings of a very light brown and a dorsal black line, as well as a black spot on the side of each scutum. In some individuals there is on the anterior portion of the first scutum, a black crescentic blotch, and on the posterior a border of the same tint. The anterior aspect of the vertex is long and narrow and deeply emarginate inferiorly, where it is denticulate and fringed with two rows of distant hairs. The eyes are somewhat elliptical, and are connected by an illy defined black band. The posterior portion of the body is not pubescent. The outer piece of the male genital appendages is rather long, straight and somewhat clavate, and distally pilose. The inner process is large, and is formed of a plate so folded longitudinally as to form a groove on the inner edge. From the base of the genital appendage springs a slender process, which soon bifurcates; the more slender of the division is the longer. They both soon enter the groove, before spoken of, the shorter and more robust being distal as to the other, and emerging from the groove on the other side of the main process, whilst the longer comes out on the side it enters. The female genital appendages are composed of a broad, thin piece, from which arises a pair of filiform, feet-like processes, besides two other very robust ones. These last are sparsely pilose, and about as long as broad. They reach about to the base of the filiform bodies, and have a slit-like orifice in their summit.

Length of body, two and a half inches.

Hab.—Oregon. Smithsonian Museum.

I. IMMACULATUS.

I. saturate rubido-brunneus, haud maculatus; antennis modice longis, filiformibus, vix subclavtis, pilosis; capitis margine antico modice emarginato; segmentis 48—51: scutis infra canaliculatis; mucrone modico, uncinato, robusto, acuto.

The color of all our specimens is a very dark reddish brown, unrelieved by any other tint. On the vertex is a pair of coarse punctations, as in *I. Canadensis*. The lateral processes of the first scutum in the female, although small, are somewhat canaliculate. The mucro is certainly smaller than that of *I. Canadensis*. The male genital appendages are composed of two parts. The outer of these consists of a somewhat clavate and pilose process, with a curiously folded and contorted plate on its inner side. The other portion is formed of a straight process, which has several minute, spine-like bodies on its free extremity, and is proximally suddenly contracted, and then expand somewhat, so as to give an appearance of emargination. From the base of this springs another, almost filamentous process.

The female genital appendages consist of two bodies conjoined at their bases, and blunt at their free extremity. When viewed from one aspect, they appear cylindrical, but from the other, flattened or even concave; opposite to the latter face there is a broad, irregular piece, which has its free extremity scolloped.

Hab.—Catskill Mountains, N. Y. Dr. H. C. Wood, Jr.

I. CANALICULATUS.

I. brunneus, interdum cæruleo tinctus; antennis filiformibus, pilosis, nonnihil clavatis; segmentis 51; scutis supra et infra arcte canaliculatis, singulo pilorum longorum distantium serie unica instructo; mucrone longo, recto; squamis analibus longe pilosis; squama preanali triangula, acuminata.

The color of this species is a dark brown, with sometimes a bluish tint, and very gradually mottled with light brown. The triangular eyes are connected by an obscure black band. The labial margin is broadly emarginate, and is furnished with two or three denticules, as well as a double row of distant rigid hairs. The joints of the antennæ are tipped with white. The first scutum is, in the female, slightly prolonged laterally, where it is rounded off; on its anterior surface there is a dark somewhat crescentic blotch. The anterior of the two subscuta, forming each scutum, is closely and deeply canaliculate through its whole circumference; it is broader than the posterior, and very slightly elevated, so as to give the body somewhat of a moniliform appearance. The ring of hairs surrounding each scutum is frequently imperfect; it may be from the handling of the specimen. The posterior subscutum is smooth above, and distantly and shallowly canaliculate below. The posterior portion of the body is very pilose. I have never seen a male.

Length, one and a half inches.

Hab.—Chester Co., Pennsylvania. Dr. H. C. Wood, Jr.

I. LAQUEATUS.

I. brunneus, interdum cæruleo tinctus; antennis filiformibus, pilosis, nonnihil clavatis; segmentis 49; scutis et supra et infra valde arcteque canaliculatis; mucrone longo et recto; squama preanali triangula, vix acuminata.

The color of this species is brown, sometimes bluish, mottled, almost areolated, with light brown. The eyes are triangular, and are united by a dark band. The head has its anterior margin broadly emarginate, denticulate and furnished with two rows of distant rigid hairs. The antennæ have their proximal joints nearly cylindrical, and are light colored, with their articles indistinctly tipped with white. The first scutum has rather small lateral processes, and is ornamented on its anterior border with a dark band. The anterior subscutum is deeply and closely canaliculate over the whole of its surface. The anal scales are furnished with a series of long hairs along their valvular margin. The posterior portion is generally adorned with a very few scattered hairs, but I have never seen it pilose.

Length, three-quarters of an inch.

This species differs from *I. canaliculatus* in its smaller size—the absence of hairs on the anterior, and their paucity on the posterior portion of the body, and in the mucro being larger in proportion to the rest of the animal. Yet they may possibly prove to be the young of that species.

Hab—Chester Co., Pennsylvania. Dr. H. C. Wood, Jr.

I. MILESII.

I. saturate brunneus; antennis filiformibus, longis, pilosis, clavatis; scutis infra arcte et valde, supra interdum obsolete, canaliculatis; segmentis 38; mucrone nullo.

The color of this species is a very dark, almost black brown; but the anterior portion of the body, and especially the head, is lighter. The antennæ are very pilose, and quite strongly clavate. The eyes are connected together by a black band. The anterior scuta have their lateral surfaces closely and deeply canaliculate, but are almost smooth on their upper surface. The posterior are everywhere deeply channeled, although more so below than above. There are a few hairs on the anal scales. The anal scutum is not mucronate. It affords me pleasure to dedicate this species to Prof. Miles, who is laboring so assiduously and successfully to develop the zoology of Michigan.

Hab.—Michigan. Col. State Agricultural College. Prof. Miles.

I. CINEREFRONS.

I. brunneus, cinereo annulatus; capitis superficia antica cinerea; mucrone nullo, squama preanali triangula, haud acuminata.

The color of this species is dark brown. The anterior surface of the head is an obscure gray color, with a dark band inferiorly. There is between the upper and anterior surface of the head a well marked angle, almost an elevated ridge. The lower margin is fringed with a few hairs, and is emarginate and armed with a few denticules. The triangular eyes are connected by a distinct, impressed line. On the upper portion of the anterior surface of the head are two round, light dots surrounded by a darker tint. The antennæ are wanting in the only specimen, a female, that I have seen, which is so mutilated that I cannot say certainly of how many segments it was composed; the number, however, was probably either 34 or 45. The first scutum has very small, lateral processes. It is light brown, bordered with a dark band, edged with a grayish tint. The anterior portion of the body is of a lighter shade than the posterior, and has the grayish annuli more distinctly pronounced. The anal scutum is not mucronate. The anal scales are not pilose.

Hab.—Oregon. Smithsonian Institution.

I. CÆRULEO-CINCTUS.

I. brunneus, saturate cæruleo annulatus; segmentis 42; antennis parvis; scutis infra et supra modice canaliculatis; mucrone nullo.

The color of this species is brown, with a dark, sometimes obsolete ring of blue to each segment, except the most anterior. The lower portion of the anterior surface of the head is light brown. The labial margin is scarcely emarginate, but is rounded and fringed with rigid hairs. The eyes are arranged in subtriangular patches, with their transverse diameter much the greater. They are connected by a black band, which is much broader in the middle than at the ends. The first scutum is large, with very small lateral processes even in the female. There is on its anterior edge a very obscure light border, and a little posterior to this a black, more or less obsolete, band. The scuta are regularly, although rather lightly and distantly canaliculate over their whole surface. The last scutum is distinctly but minutely punctate, has its edge whitish, and is not at all mucronate. The anal scales are not at all pilose. The specimens from which this description are taken are in so bad a condition that I have hesitated to notice them. But probably the description will be found to be sufficiently accurate for the identification of the species.

Length of body, about one and a half inches.

I. HORTENSIS.

I. brunneus, lateribus maculis nigris ornatis; antennis modicé brevibus, pilosis, filiformibus, clavatis; segmentis 42; scutis arcte canaliculatis et infra et supra; mucrone nullo; squama preanali triangula, apice rotundato.

The general color of this species is rather dark brown in the adult. But when an individual is examined with a magnifier, it is seen to be beautifully areolated with light brown. In young specimens and adults, which have recently shed their exuviæ, the color often verges on white, whilst the side spots are black, contrasting strongly with the general tint. The head is rather broad inferiorly, and has its lower margin shallowly emarginate, and distinctly though minutely denticulate. The triangular eyes are connected by a broad, dark band. The first scutum is ornamented on its anterior portion by a dark, transverse band. The lateral processes are almost wanting, even in the female. There is on each side a series of large, black dots, one to a scutum, commencing rather abruptly at about the 5th or 6th segment, and ending in the same way at about the 39th. The subscutum on which they are situated are scarcely canaliculate. The anal scutum is about equal in length to the two preceding it.

Length half to 1 inch.

Philadelphia. Dr. H. C. Wood, Jr.

I. VIRGATUS.

I. saturate brunneus, dorso luteolo, medio linea nigra instructo, antennis modice longis, pilosis, clavatis; segmentis 35; scutis copiose distincte canaliculatis; mucrone subnullo; squamis analibus sparse pilosis; squama preanali lata, subtriangula, apice rotundato.

The sides of the body are deep brown, almost black, whilst the dorsum approaches a yellowish fawn color, and has a strongly pronounced, black, median line. The lower margin of the head is broadly emarginate, denticulate, and fringed with a series of hairs. The anterior surface is mottled with light brown, and has a dark median band, terminating in a transverse one low down. The under surface of the body is light-colored, and is often somewhat areolated. There are some specimens whose pattern of coloration is light brown or fawn colored, with two lateral and one median dark stripe. Are these, individuals which have recently cast off their exuviæ? The eye-patches are somewhat parabolic. The joints of the antennæ are obconical, dark colored, and tipped with white. The lateral processes are small. The grooving of the scuta is in some specimens somewhat obsolete on the dorsum. The posterior scutum is light colored. I have never identified a male.

Length, ½ to ¾ of an inch.

Hab.—Philadelphia. Dr. Joseph Leidy, Dr. H. C. Wood, Jr. Washington, D. C. F. W. Putnam, Coll. Museum Comp. Zoology.

Genus SPIROBOLUS.

S. SPINIGERUS.

S. fulvus, maculis saturate viridis maximis ornatus; capite minute punctato, infra punctorum magnorum serie instructo; oculis suborbiculatis; antennis longis; segmentis 48; scutis leviter sparse punctatis; squama præanali triangula.

The color of this species is fulvous, often varying towards orange. On each scutum there is a large dark-green transverse crescentic blotch. This is often so wide superiorly as to involve the whole of the dorsum. In some individuals there are lateral series of white blotches, and occasionally a black line on each side. These are, however, not common. The head has a strongly pronounced median furrow, and is greenish superiorly. The eye spots are somewhat orbicular, with occasionally a tendency to become tetra- or polygonal. The antennæ are longer than in *S. marginatus*. The scuta are not rough, and are very lightly or even obsoletely furrowed beneath. The spines on the inferior surface of legs are very numerous and acute. The male genital appendages are formed of two main portions joined together, as in *S. marginatus*. The large plate of the main process is broad. The upper border of its face has a wavy outline. Externally it is produced into an alar portion, which ends in a blunt process at right angles to it. The inner piece is composed of a basilar and superior joint. The basilar is very long. The other is curved, and presents on one aspect a strongly convex, on the other a strongly concave surface. It ends in a blunt point, and is armed with a large blunt process and an acute spine. The female genital appendages appear to consist on each side of a process deeply placed within the body—this is thin on its free margin, which is rounded, though somewhat acuminate—below it is contracted and thickened. The three pairs of feet immediately in front of the genital aperture in the male have their coxæ produced into long processes. These are often of a curious form, but do not seem constant in this. The fourth and even fifth coxæ have small processes.

Hab.—Florida. South Carolina. Smithsonian Institution.

S. UNCIGERUS.

S. læte brunneus, saturate-rubido-brunneo annulatus; capite sparse minute punctato et corrugato, antice punctorum maximorum serie instructo; segmentis 50—53; scutis supra et copiose punctatis et corrugatis; squama anale triangula.

The color of this species is a bright brown, with an annulus of dark reddish brown on the posterior border of each segment. The head is distinctly medianly canaliculate, except in the centre, and has the row of dots on its anterior face as in *S. marginatus*, but is not as decidedly punctate elsewhere as in that species. The eyes are triangular. The antennæ closely resemble those of *S. marginatus*, but are, perhaps, rather shorter and more compressed. The first scutum is banded, both anteriorly and posteriorly. The lateral processes, even the female, are almost wanting. The second scutum is produced forwards as in *S. marginatus*. The male genital appendages are composed of a yoke-like piece and two outer parts, which it connects. The central piece may be described as formed by two plates (although but really one) meeting at an angle in the centre and attached to the outer parts at their other extremities. These outer articles are formed each as follows: First, There is a large plate which is bent around an inner basal piece, and is deeply notched laterally, but is produced anteriorly into a broad almost rudely punctate plate, and posteriorly into a short, slender process, terminating in an imperfect hook. This last process is sometimes obsolete. Second, Articulating with the inner basal piece, alluded to, there exists a large, strongly-curved, acute hook or claw, whose distal extremity is subcylindrical. The female genital appendages are small, and are composed on each side of a very thin plate and a process about a line in length, irregularly prismatic in shape proximally; but distally excavated suddenly, so as to be flattened for the remainder of its course.

Hab.—California. Smithsonian Institution.

S. ANGUSTICEPS.

S. niger, lateribus brunneo maculatis; capitis superficie antica angusta, longa, supra nigra, infra albido-brunnea; antennis ? ; segmentis 75; scutis et infra et supra distincte canaliculatis; squama anali triangula.

The color of this species is black, with a brown band on the sides, in which is a black dot marking the position of the lateral pores. The lower portion of the head is very light-brown, and has its margin rather deeply emarginate. Along the posterior cephalic border is a somewhat crescentic area, which is nearly smooth and is medianly canaliculate, adjoining this the surface suddenly is rudely punctate, but gradually becomes smoother. The eyes are arranged in three transverse rows, the posterior being much the longer. The first scutum is copiously coarsely punctate, and is posteriorly slightly canaliculate on the dorsum, but distinctly so on the sides. The lateral processes, even in the female, are very small, the second scutum being produced forwards so as to abut on the head. The posterior subscuta are on the dorsum closely, rather deeply, and more or less obliquely canaliculate, but on the sides less distinctly and more distantly so. The anterior subscuta are very distantly and much more lightly and obliquely canaliculate, and are also more closely channeled below than above. The surface of the anal scutum is irregularly and minutely corrugate. We have seen but one specimen,—a female. The female genital appendages appear to consist of two conoidal bodies coalescing at their bases and united together towards their apices by a broad plate, so placed as to present towards them an inclined surface. Into the base of these pyramidal processes fit other somewhat prismatic bodies, with their thin edge formed of several pieces.

Length 4½ inches.

Hab.—San Francisco. Smithsonian Institution. R. D. Cutts.

Notes of Botanical Visits to the Lower Part of Delaware and the Eastern Shore of Maryland.

BY WM. M. CANBY.

The peninsula lying between Delaware and Chesapeake Bays has been almost a *terra incognita* to botanists; although, from its geographical position, and from the varied character of the country, embracing great variety of soil, salt and fresh water marshes and rivers, large swamps, and a considerable extent of coast, it might well be supposed to be a fine botanical district.

In this expectation, the writer, (sometimes accompanied by botanical friends,) made short visits to a few places in the counties of Sussex, in Delaware, and Worcester and Somerset, in Maryland, during the months of September and October last. Taking into account the lateness of the season and the limited extent of country looked over, the result, as shown in the list below, is encouraging, and leads to the belief that a more extensive exploration would yield further additions to the Northern Flora.

When our knowledge of the botany of this peninsula becomes more perfect, an interesting comparison might be made of its Flora with that of the lower part of Illinois; the plants of the Southern Mississippi Valley would probably be found creeping up into the latter, as those of the Southern coast, and Pine Barren region, do into the former.

Of a considerable number of rare and interesting plants collected, only those not described in the "Manual" of Prof. Gray are given in the list below, with some observations on rare allied species. One or two, detected in localities not in the district under consideration, are also given.

Desmodium ochroleucum, M. A. Curtis, in Herb. Gray. (*Hedysarum humifusum*, Ell. in Herb. Muhl.): caule procumbente tereti hirsuto elongato; foliolis ovatis aliquanto rhomboidiis reticulatis; stipulis et bractiis ovatis acuminatis striatis; floribus ochroleucis; lomentorum articulis, ($\frac{1}{4}$—$\frac{1}{2}$ pollicaribus,) reticulatis sæpius contortis.

In an open woodland, one mile south of "Public Landing," (on Chingoteague Bay,) Worcester county, Maryland. Fl. Sept. 4. Fruit. Oct. 2.

Stems many (6 to 10), 18 inches to 3 ft. long, spreading in every direction from the root, and, with the petioles and pedicels, quite hirsute with spreading hairs, as well as pubescent with shorter hooked ones. Flowers ochroleucus! Legume (always ?) much contorted.

There is a specimen of this plant without flowers in Muhlenberg's herbarium, sent by Elliott from South Carolina under the name of *Hedysarum humifusum*. The fruit on this presents the same twisted appearance as in all the Maryland specimens. This specimen is not in the general collection, but is contained in a special collection of the genus *Hedysarum*, which is accompanied by a numbered list. In this, Elliott's plant is placed in a distinct paper, and far separated from Muhlenberg's *humifusum*; the former being No. 19, the latter (in full), "No. 43 ——— *humifusum*, Aug. 25, 27, 12"—(the latter number probably intended for the year 1812). Thus it would appear, that Muhlenberg, at the time of making up this monographic collection, considered them distinct, as they certainly are. But afterwards, in his description in the MSS., Plant. Amer. Sept., and in the printed work, he confounds them, and in the latter the locality of *Hedysarum humifusum* is given, "Mass. to Penna. and Carolina." The last is to be excluded, as the species has been found only near[*] Waltham, Mass. (Bigelow) and Lancaster, Penna.

Hydrocotyle vulgaris, L. ?—In a swamp one mile east of Snow Hill, Maryland. Umbels, or rather verticils, two to five. Sept. to Oct.

Hydrocotyle repanda, Pers.—A glabrate form, found in meadows bordering Chingoteague Bay, Worcester county, Maryland. Oct.

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[*] The Mass. locality is now supposed to be destroyed. In Muhlenberg's MSS. in the library of the Academy, he gives the date of collection and locality of his plant,—viz., "Aug. 28, 12, (1812), upon Montgomery Island." This may be in the River Susquehanna. The attention of botanists in the neighborhood is requested to this point. The plant may yet be identified and specimens furnished from the original locality. The descriptions in Torrey and Gray, Gray's Manual, &c., appear to be sufficient, except that the character,—stem angled or striated,—should be added to distinguish it from the round stem of *D. ochroleucum*.

The three allied species may be thus compared:

D. rotundifolium.—Stem *hirsute* and angled; leaflets *orbicular;* bracts and stipules *broadly ovate;* flowers purple; joints of the legume large.

D. humifusum.—Stem angled, nearly *smooth;* leaflets *ovate;* stipules and bracts *lanceolate;* flowers purple; joints of the legume *small.*

D. ochroleucum.—Stem terete, *hirsute;* leaflets *ovate reticulated;* stipules and bracts *ovate acuminate;* flowers *ochroleucus;* joints of the *twisted pod large.*

ELEPHANTOPUS TOMENTOSUS, L.—Common in open woodlands from Milford, Delaware, southward. Sept., Oct.

PLUCHEA BIFRONS, D.C.—Borders of a mill-pond near Salisbury, Somerset county, Md. Sept.

MENTHA AQUATICA, L.—Shores of Nanticoke River near Seaford, Delaware. Sept. Stems 3 to 4 feet long, decumbent, sending up erect flowering branches. Probably naturalized.

MYOSOTIS VERSICOLOR, Pers. — Naturalized near Wilmington, Delaware. June.

HELIOTROPIUM CURASSAVICUM, L.—Shores of Chingoteague Bay. Doubtless indigenous.

ALNUS MARITIMA, Muhl.! in Herb. et Plant. Amer. Sept., MSS., vol. i. p. 193; Nutt., Sylva, vol. i. p. 34. Frequent in Sussex county, Delaware, and southward in Maryland. Flowering in September! Specimens of this plant, consisting of small branches with leaves only, exist in the herbarium of Muhlenberg. In the Academy's herbarium there are specimens, collected by Dr. Pickering, with leaves and fruit. By last season's collections, the anomaly of a fall-flowering alder is brought to light. So singular a departure from the habit of the genus may well excite a doubt as to whether it is not a mere sport, or the precocious blooming of an ordinarily spring-flowering plant. Yet the observations made seem to preclude this idea. The plant was noticed at several stations over a range of fifty miles, and in the beginning of September was every where found in blossom. In going over much the same ground about the middle of the month, the sterile catkins had *all* fallen or withered; and when again observed in the beginning of October, no preparation for spring flowering could be seen, although on *A. serrulata* the young catkins were already an inch long. Next season's observations will probably decide the question. This shrub, or small tree, attains the height of 16 to 18 feet, growing much like *A. serrulata*, but with a more open habit, and with the bark lighter colored. The leaves are smooth and glossy, on longish petioles, not furrowed above, thick, and strongly veined beneath. Sterile catkins resembling those of *A. incana*, but the scales more glutinous. The glossy foliage and handsome sterile catkins (should they prove to be regularly produced in the fall), would make this a desirable shrub in lawns, &c.

CEPHALOXYS FLABELLATA, Desv., (*Juncus repens*, Michx.)—Low grounds near Salisbury and Snow Hill, Md. Sept.

ELEOCHARIS SIMPLEX, Torr.—Common in low grounds in Sussex county, Delaware and in Maryland.

SCIRPUS CANBYI, Gray, n. sp.*—In a small stream and mill-pond east of Salis-

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* Dr. Gray has kindly furnished the following:

"SCIRPUS CANBYI, sp. nov.—Culmo elato (3—5-pedali) folio prælongo canaliculato-triquetro stipato inferne obtuse trigono superne triquetro apice in involucrum monophyllum pseudo-umbellam plurifloram longe superans desinente; umbella sessili dichotomo-composita; umbellulis sæpissime biradiatis involucellatis, radiis omnibus elongatis plerisque monostachyis; spicis oblongis; squamis laxe imbricatis oblongo-ovatis acutiusculis dorso viridulis nervosis marginibus late scariosis pallidis; setis perigynii 6 patentim barbellatis achenium obovato-triquetrum subito rostellatum paullo superantibus.

"So distinct is this species that there is no other known to me with which it may be particularly compared. By its mode of growth, triangular stem and erect one-leaved involucre, appearing like a continuation of the naked stem, it would have to be referred to the section which contains *S. pungens*. But the radical leaf is remarkably developed; the greenish spikes (half an inch long) of a very different aspect, all on long and slender rays, which come off in pairs (the first pair closely sessile at the base of the involucre) from the nodes of a zigzag rhachis, in the axil of a bract or involucel (the lowest of which resembles the involucral leaf only on a smaller scale, the others more reduced and scarious), and mostly accombury, Md., growing in water from six inches to two and a half feet deep. Stems throwing out scaly-jointed runners from the base, which take root at the joints, and sometimes produce a few delicate immersed leaves. Upper part of stem and leaves sharply triangular, the involucre channelled or bayonet-shaped, six to nine inches long. The credit of detecting this species belongs to my friend, Albert Commons, of Delaware, who accompanied me in one of my visits.

RHYNCHOSPORA PALLIDA, M. A. Curtis, Chapman's Flora, p. 527.—Not uncommon in the Pine Barrens of New Jersey, especially near Quaker Bridge and Atsion. June and July. This has probably been overlooked, from its close external resemblance to *R. alba*, Vahl., but it is very distinct.

ARISTIDA LANATA, Poir.—Sandy soil near Salisbury, Md. October.

The Librarian read his annual report for 1863, as follows:—

REPORT OF THE LIBRARIAN FOR 1863.

The Librarian begs leave to report that, during the year just past, the following additions have been made to the Library, viz:

Folio 15; Quarto 282; Octavo 638; Duodecimo 16; Maps, &c., 15; Total 966. Of which there were Volumes 101; Tracts 850; Maps 15; Total 966.

These have been received from the following sources:—

Editors 157; Authors 82; Societies 449; Maclure Fund 43; Library Fund 81; Dr. Wilson 124; Smithsonian Institution 4; J. P. Hall, 1; J. W. Dawson 1; A. D. Bache 1; Secretary of the Treasury 1; Asa Gray 1; R. L. Barnes 1; S. S. Garrigues 1; Dr. Hammond, U. S. A., 1; Geol. Survey of India 1; J. L. Darlington 1; New York State Library 10; New York State University 3; W. I. Kintsing 1; Isaac Lea 1; P. A. Dare 1; Total 966.

These belong to the following departments, viz.:—

Journals 694; Bibliography 24; Agriculture 1; Languages 2; Geology 56; Ornithology 28; Botany 20; Physical Science13; Conchology 19; Mammalogy 3; Biography 3; Gen. Nat. History 36; Mineralogy 2; Anatomy and Physiology 19; Entomology 29; Voyages and Travels 2; Herpetology 2; Medicine 3; Religion 1; Antiquities 2; Ichthyology 1; Helminthology 1; Chemistry 5; Total 966.

All of which is respectfully submitted.

J. D. SERGEANT, *Librarian.*

Pursuant to the By-Laws, an election of members of the Standing Committees for 1864 was held, as follows:—

ETHNOLOGY.

J. A. MEIGS,
S. S. HALDEMAN,
I. I. HAYES,

BOTANY.

E. DURAND,
JOSEPH CARSON,
AUBREY H. SMITH.

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panied by an internal scarious bract; and the scales of the spike are thin-membranaceous and greenish. Stamens 3. Bristles of the perigynium stout, beset with widely spreading or somewhat retrorse, weak, short hairs rather than barbs. Style 3-cleft. Achenium smooth, a line and a half long, triangular, with the inner face broadest; the broad and even retuse summit tipped with a conspicuous, very abrupt and narrow beak At my especial request, I am permitted to characterize this species and to name it in honor of the collector, my valued correspondent, Mr. Canby. I leave it to him to give an account of its mode of growth and general character." A. GRAY.

COMP. ANAT. AND GEN. ZOOLOGY.

Joseph Leidy,
J. M. Corse,
J. H. Slack.

MAMMALOGY.

J. H. Slack,
John Cassin,
J. L. LeConte.

ORNITHOLOGY.

John Cassin,
S. W. Woodhouse,
J. H. Slack.

HERPETOLOGY & ICHTHYOLOGY.

E. D. Cope,
R. Bridges,
J. C. Morris.

CONCHOLOGY.

T. A. Conrad,
W. G. Binney,
G. W. Tryon, Jr.

ENTOMOLOGY AND CRUSTACEA.

R. Bridges,
E. T. Cresson,
J. F. Knight.

GEOLOGY.

Isaac Lea,
Charles E. Smith,
J. P. Lesley.

MINERALOGY.

Wm. S. Vaux,
J. C. Trautwine,
T. D. Rand.

PALÆONTOLOGY.

Joseph Leidy,
T. A. Conrad,
J. L. Le Conte.

PHYSICS.

B. Howard Rand,
Wm. M. Uhler,
R. E. Rogers.

LIBRARY.

Wm. S. Vaux,
Joseph Leidy,
Joseph Jeanes.

PROCEEDINGS.

Joseph Leidy,
Wm. S. Vaux,
John Cassin,
Thomas Stewardson,
Robert Bridges.

February 2d.

Vice-President Vaux in the Chair.

Twenty-one members present.

The following were presented for publication:—

"Synoptical List of the Grouse," &c. By D. G. Elliott.

"Synonymy of the Species of Strepomatidæ, No. 2." By Geo. W. Tryon, Jr.

February 9th.

Vice-President Bridges in the Chair.

Seventeen members present.

February 16th.

Vice-President Bridges in the Chair.

Twenty-two members present.

The Committee on Proceedings announced the publication of the Proceedings for December, 1863.

Dr. Wilcox presented for publication a continuation of his paper for January 12th.

February 23d.

Vice-President **Bridges** in the Chair.

Twenty-two members present.

The following was presented and unanimously adopted:—

Resolved, That the specimens of antique art belonging to the Academy be deposited in the Museum of the American Philosophical Society, provided that they shall be returned on demand, and that the Curators of the Society shall give a receipt for the same to the Curators of the Academy.

On report of the respective committees, the following were ordered to be published:—

The Crania of COLYMBUS TORQUATUS and C. ADAMSII compared.

BY ELLIOTT COUES, M. D.

I have already, in a previous paper,* presented the external characters of size, form, and color by which the *C. Adamsii* may be distinguished from the common *C. torquatus*. To more completely substantiate the claims of the former to specific distinction, which I understand is denied it by some ornithologists, I have taken advantage of an opportunity of comparing the crania of the two species, to present the marked points of difference, as regards size and shape, which an examination of the skulls shows to exist. It is perfectly easy to diagnose either species from the characters of their crania alone.

As might be expected from the relative dimensions of the two birds, the cranium of *C. Adamsii* is considerably *larger* than that of *C. torquatus*. The difference is particularly striking in the length of the skull, taken as a whole, as well as in the longitudinal dimensions of its individual elements. The total length exceeds that of *C. torquatus* by fully an inch; and the difference in the length of particular bones, as the intermaxillary, palatals, malars, vomer, etc., is proportionately as much. In connection with this increase in the length of skull, there is to be taken into consideration another point, which confers upon the cranium of *C. Adamsii* a marked difference in general contour,—viz., its remarkable *narrowness*. In width at the several points, the cranium by no means preponderates over that of *C. torquatus* in proportion to its marked difference in length. Thus, is diameter across the fronto-maxillary suture, or across the anterior or posterior orbital process, is, both absolutely and relatively, but little greater than that of *C. torquatus*, while across the mastoid processes the width is absolutely the same, and therefore relatively *less* in *C. Adamsii*.

The external character, which is perhaps the most distinctive feature of *C. Adamsii*—viz., the size and shape of the bill, corresponds, of course, to a like modification of the proportions of the intermaxillary and inferior maxillary bones. In fact, the difference in the relative proportions of the crania of the two birds is produced, in great measure, by the greater developement and somewhat different shape of these two bones. The discrepancies in length have already been adverted to. Those of shape consist chiefly in the greater *elevation of the apices* of the inter- and infero-maxillary bones. The line formed by the mandibular ramus of the intermaxillary and the malar bone, is in *torquatus* a gentle curve, the concavity of which looks downwards; in *Adamsii* it is a straight line. The commissural edge of the inferior maxillary of *torquatus* is about straight as far as the angle of the jaw; in *Adamsii* it is a gentle curve, whose concavity looks upwards. The greater production of the inter- and infero-maxillary bones makes their apices much more acute in *Adamsii* than in *torquatus*, while, at the same time, in consequence of the comparative narrowness of the skull of the former, the angle of divergence of the rami of these two bones is not greater, and the bill on this account no wider. The symphysis of the mandibular rami is longer in *Adamsii* than in *torquatus*, and the prominence at the angle of the jaw is more marked.

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* *Vide* Proc. Acad. Nat. Sci., Philada., April, 1862, p. 227.

In addition to the above, it may be said, in general terms, that the various ridges and depressions of the skull of *Adamsii* are more strongly marked than those of *torquatus*, corresponding to the superior size and muscularity of the former. The occipital protuberance and crest, the interparietal and the median frontal ridge are exceedingly prominent, while at the same time, the crotaphyte depression, the temporal and digastric fossæ and the supra orbital fossæ for the lodgement of the nasal glands are deep and well defined. The frontal bone of *Adamsii* rises more rapidly than that of *torquatus*, leaving a deeper fossa at the fronto-maxillary suture, and also producing chiefly the difference which exists in the absolute height of the two crania.

I append the detailed comparative measurements of the most important dimensions of the skulls of the two birds, which will show at a *coup d'œil* the absolute and relative difference in size and shape. Notice particularly the great discrepancies in the longitudinal dimensions as compared with the slight difference in the several transverse measurements.

Comparative Measurements.

	C. torquatus.	*C. Adamsii.*
Length from apex of intermaxillary to occipital protuberance	5·80*	6·60
" " " fronto-maxillary suture	3·25	4·15
" " " anterior orbital process	3·65	4·40
" " " posterior do. do.	4·85	5·75
" " " apex of os lachrym	3·65	4·40
" " " nasal foramen	1·65	2·05
" " " maxillo-malar suture	2·90	3·55
" " " tympano-malar artic	5·30	6·20
" " " apex of vomer	2·60	3·20
" " " posterior end of palatals	4·50	5·10
" of inferior maxillary	5·60	6·60
" of symphysis of inferior maxillary	1·10	1·40
" from apex of inferior maxillary to angle of jaw	4·90	5·00
" of nasal foramen	1·20	1·40
Width of skull across fronto maxillary suture	·80	·90
" " " anterior orbital processes	1·08	1·20
" " " posterior do. do.	1·95	2·00
" " " mastoid processes	1·85	1·85
Greatest height of skull (without lower jaw)	1·50	1·70
" depth of inferior maxillary	·70	·80

* English inches and hundredths.

Remarks upon a Proposed Arrangement of the Family of GROUSE, and New Genera added.

BY D. G. ELLIOT.

It has seemed to me advisable to give in a condensed form, before treating the subject in a more elaborate manner in my forthcoming Monograph, the results of my investigations, and the arrangement I would propose for the Grouse Family.

Tetrao, than which no generic term has been more abused in its application, for it appears to have been indiscriminately given to any gallinaceous bird, strictly belongs only to *Urogallus* and *Urogalloides*. The former is the typical *Tetrao*, as instituted by Linnæus, and possesses the beard-like appendage observed, save in its near ally, in no other bird of this family.

America has no representative of this genus, the nearest approach to it perhaps, in the form of the tail and general appearance, being the bird commonly known as *Tetrao obscurus;* but it would seem that, excepting the single species of *Bonasa sylvestris*, no European grouse can be considered as included even in the same genus with those inhabiting the New World.

I would state here, that I am not now speaking of the Lagopidæ, for I do not consider them as strictly grouse. The synoptical list that I would, therefore, propose for this portion of the Tetronidæ, is as follows:—

1*st*. The Genus *Tetrao*—confined to Europe and Asia; comprising *T. urogallus* and *T. urogalloides*.

2*d*. *Centrocercus*—confined to America; comprising *C. urophasianus*.

3*d*. *Lyrurus*—confined to Europe; comprising *L. tetrix*.

For the next group, as its members appear to possess sufficient characters to distinguish the species from the commonly known *T. Canadensis*, in having gular sacks, the extraordinary number of twenty feathers in the tail, instead of sixteen, I would propose the term—

4*th*. *Dendragapus*—confined to America; comprising *D. obscurus* and *Richardsonii*.

5*th*. *Canace*—confined to America; comprising *C. Canadensis* and *C. Franklinii*.

6*th*. I would propose, as a generic term, founded upon the peculiar formation of its primary feathers, the specific appellation *Falcipennis*—confined to Asia, and in compliment to its discoverer *Hartlaubii*.

7*th*. *Cupidonia*—confined to America; comprising *C. cupido*.

8*th*. *Pediæcætes*—confined to America; comprising *P. columbianus* and *P. phasianellus*.

9*th*. *Bonasa*—Europe and America; comprising *B. umbellus*, *B. umbelloides*, *B. sylvestris*, and *B. sabini*.

Tetrao derbianus (Gould), appears to be identical with the common *tetrix*. This opinion is formed upon a specimen, kindly sent to me by Mr. Gould, which he thinks is the same as the type. The latter is now in the Liverpool Museum.

I can discover no difference between this example and the usual style of *T. tetrix*, except that the tail is a trifle longer; but as this varies considerably among the Black Grouse, I have deemed it advisable to consider the genus *Lyrurus* as possessed of but one species.

Synonymy of the Species of STREPOMATIDÆ, a Family of Fluviatile Mollusca inhabiting North America.

Part 2.

BY GEORGE W. TRYON, JR.

Goniobasic Section.

Genus GONIOBASIS, Lea.

Goniobasis, Lea, Proc. Acad. Nat. Sci. p. 262, May, 1862. Journ. Acad. Nat. Sci. v. pt. 3, p. 217, March, 1863. Obs. ix. p. 39.
Ceriphasia, Swainson, (sp.) H. and A. Adams, Genera i. p. 298, Feb. 1854. Chenu, Man. de Conchyl. i. p. 290, 1859.
Pachycheilus, Lea, (sp.) H. and A. Adams, Genera i. p. 298, Feb. 1854.
Potadoma, Swainson, (sp.) H. and A. Adams, Genera i. p. 299, Feb. 1854. Chenu, Man. de Conchyl. i. p. 290, 1859.
Elimia, (sp.) H. and A. Adams, Genera i. p. 300, Feb. 1854. Chenu, Man. de Conchyl. i. p. 290, 1859.
Melasma, (sp.) H. and A. Adams, Genera i. p. 300, Feb. 1854. Chenu, Man. de Conchyl. i. p. 292, 1859.
Hemisinus, Swainson, (sp.) H. and A. Adams, Genera i. p. 302, Feb. 1854.
Juga, (sp.) H. and A. Adams, Genera i. p. 304, Feb. 1854. Chenu, Man. de Conchyl. i. p. 293, 1859.
Megara, (sp.) H. and A. Adams, Genera i. p. 306, Feb. 1854. Chenu, Man. de Conchyl. i. p. 293, 1859.
Pleurocera, Rafinesque, Haldeman, Proc. Acad. Nat. Sci. p. 274, 1863.
Melania, (sp.) Auct.*

SPECIES.

A. *Shell spirally ridged.*

1. G. procissa, Anthony.†
Melania procissa, Anthony, Ann. Lyc. Nat. Hist. N. Y. vi. p. 109, t. 3, f. 9, March, 1854. Binney, Check List, No. 218. Brot, List, p. 59. Reeve, Monog. Melania, sp. 342.

B. *Shell tuberculate or nodulous.*

2. G. gratiosa, Lea.
Melania gratiosa, Lea, Proc. Acad. Nat. Sci. p, 122, May, 1861.
Goniobasis gratiosa, Lea, Jour. Acad. Nat. Sci. v. pt. 3, p. 241, t. 35, f. 43, March, 1863. Obs. ix. p. 63.

2*a*. G. lachryma, Anthony.‡
Melania lachryma, Anthony, Reeve, Monog. Melania, sp. 473, May, 1861. Brot, List, p. 32.

3. G. gibberosa, Lea.
Goniobasis gibberosa, Lea, Proc. Acad. Nat. Sci. p. 266, 1862. Jour. Acad. Nat. Sci. v. pt. 3, p. 312, t. 37, f. 155, March, 1863. Obs. ix. p. 134, t. 37, f. 155.

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* Mr. Lea is the first naturalist who has properly defined this genus, and his name *Goniobasis* must therefore stand, in preference to any of the prior names given to artificial sections by the Messrs. Adams.

Of course these gentlemen are wrong in including species of this genus in the genera *Pachycheilus*, *Ceriphasia*, *Potadoma* and *Hemisinus*, which are all intended to embrace very different groups of species. Prof. Haldeman is also mistaken in placing here the *Pleurocera* of Rafinesque, a genus which undoubtedly = *Trypanostoma*, Lea.

† This may be only an elevated form of *Anculosa canalifera*, Anthony.

‡ This species and the preceding (*gratiosa*) are identical. Both descriptions bear the same date of publication, and I am therefore unable to decide which has priority.

4. G. **nubila**, Lea.*
Melania nubila, Lea, Proc. Acad. Nat. Sci. p. 118, 1861.
Goniobasis nubila, Lea, Jour. Acad. Nat. Sci. v. pt. 3, p. 235, March, 1863. Obs. ix. p. 57.

5. G. **varians**, Lea.†
Melania varians, Lea, Proc, Acad. Nat. Sci. p. 120, 1861.
Goniobasis varians, Lea, Jour. Acad. Nat. Sci. v. pt. 3, p. 219, t. 34, f. 2, March, 1863. Obs. ix. p. 41.

6. G. **Hydeii**, Conrad.
Melania Hydeii, Conrad, New Fresh-Water Shells, p. 50, t. 8, f. 1, 1834. Reeve, Monog. Melania, sp. 248. DeKay, Moll. N. York, p. 93. Wheatley, Cat. Shells U. S. p. 25. Binney, Check List, No. 141.
Melania Hydei, Conrad, Jay, Cat. Shells, 4th edit. p. 273. Brot, List, p. 32. Hanley, Conch. Misc. t. 1, f. 3.
Melania Hydii, Conrad, Catlow, Conch. Nomenc. p. 187.

7. G. **decorata**, Anthony.
Melania decorata, Anthony, Proc. Acad. Nat. Sci. p. 55, Feb. 1860. Reeve, Monog. Melania, sp. 251. Binney, Check List, No. 86. Brot, List, p. 32.
Goniobasis Tryoniana,‡ Lea, Proc. Acad. Nat. Sci. p. 272, 1862. Jour. Acad. Nat. Sci. v. pt. 3, p. 342, t. 38, f. 207, March, 1863. Obs. ix. p. 164, t. 38, f. 207.
Goniobasis granata, Lea, Proc. Acad. Nat. Sci. p. 272, 1862. Jour. Acad. Nat. Sci. v. pt. 3, p. 343, t. 38, f. 209, March, 1863. Obs. ix. p. 165.

8. G. **cælatura**, Conrad.
Melania cælatura, Conrad, Proc. Acad. Nat. Sci. iv. p. 154, Feb. 1849. Journ. Acad. Nat. Sci. i. pt. 4, p. 278, t. 38, f. 3, Jan. 1850. Binney, Check List, No. 58. Brot, List, p. 32. Reeve, Monog. Melania, sp. 245.
Goniobasis Stewardsoniana,§ Lea, Proc. Acad. Nat. Sci. p. 272, 1862. Jour. Acad. Nat. Sci. v. pt. 3, p. 344, t. 38, f. 210, March, 1863. Obs. ix. p. 166.
Goniobasis Tryoniana, Lea, Description in part.

9. G. **occata**, Hinds.
Melania occata, Hinds, Ann. and Mag. Nat. Hist. xiv. p. 9. Zool. Voy. Sulphur. Mollusca, ii. p. 56, t. 15, f. 5. Catlow, Conch. Nomenc. p. 188. Brot, List, p. 34. Lea, Proc. Acad. Nat. Sci. p. 81, April, 1856. Reeve, Monog. Melania, sp. 267.
Juga occata, Hinds, Chenu, Man. de Conchyl. i. f. 2016.
Melania Shastaensis,‖ Lea, Reeve, Monog. Melania, sp. 318.

10. G. **catenaria**, Say.
Melania catenaria, Say, Jour. Acad. Nat. Sci. ii. p. 379, Dec. 1822. Binney, Reprint, p. 111. Binney, Check List, No. 52. Reeve, Monog. Melania, sp. 336. DeKay, Moll. N. York, p. 93. Wheatley, Cat. Shells U. S. p. 24. Gibbes, Rep't. S. Carolina, p. 19. Jay, Cat. 4th edit. p. 273. Catlow, Conch. Nomenc. p. 185. Brot, List, p. 34.

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* Closely allied to *G. oliva*, Lea, but is larger, longer and tuberculate.

† Nearly always tuberculate, and shouldered below the sutures.

‡ *G. decorata* is a young shell, and, as is usual in this group, is sharply angulated at the periphery. *G. granata* represents a half grown shell, and here the angle is almost obsolete, while *G. Tryoniana* is the mature form. The entire identity of these several descriptions is proved by a series of over two hundred specimens before me,

Mr. Lea's *figure* of *Tryoniana* belongs here, but his *description* of that species is made to include the next species, *cælatura*, Conr. The green variety of *granata* is a shell of much heavier texture, and may prove distinct.

§ Half grown shell of *cælatura*.

‖ The *Shastaensis* of Mr. Lea is a very different shell, and certainly ought never to have been confounded with this species, which it does not resemble in any particular.

Melania sublirata,[*] Conrad, Jour. Acad. Nat. Sci. 2d ser. i. pt. 4, p. 277, t. 38, f. 1, Jan. 1850. Brot, List, p. 37. Reeve, Monog. Melania, sp. 339.

Melania Floridensis,[†] Reeve, Monog. Melania, sp. 334. Brot, List, p. 34.

11. G. catenoides,[‡] Lea.

Melania catenaria, Lea, Proc. Philos. Soc. i. p. 289. Oct. 1840, (preoc.)

Melania catenoides, Lea, Philos. Trans. viii. p. 228, t. 6, f. 60. Obs. iii. p. 66. DeKay, Moll. N. Y. p. 101. Wheatley, Cat. Shells U. S. p. 24. Jay, Cat., 4th edit., p. 273. Binney, Check List, No. 53. Catlow, Conch. Nomenc. p. 185. Brot, List, p. 34. Reeve, Monog. Melania, sp. 298.

Elimia catenoides, Lea, Chenu, Man. de Conchyl. i. f. 1982.

12. G. Etowahensis, Lea.[§]

Melania Etowahensis, Lea, Reeve, Monog. Mel. sp. 426, May, 1861. Brot, List, p. .

Goniobasis Canbyi, Lea, Proc. Acad. Nat. Sci. p. 271, 1862. Jour. Acad. Nat. Sci. v. pt. 3, p. 340, t. 38, f. 204, March, 1863. Obs. ix. p. 162.

13. G. Hallenbeckii, Lea.[‖]

Goniobasis Hallenbeckii, Lea, Proc. Acad. Nat. Sci. p. 271, 1862. Jour. Acad. Nat. Sci. v. pt. 3, p. 339, t. 38, f. 203, March, 1863. Obs., ix. p. 161.

Melania Hallenbeckii, Lea, Reeve, Monog. Melania, sp. 332.

14. G. Boykiniana, Lea.

Melania Boykiniana, Lea, Proc. Philos. Soc. i. p. 289, Oct. 1840. Philos. Trans. viii. p. 228, t. 6, f. 59. Obs. iii. p. 66. DeKay, Moll. N. Y., p. 100. Wheatley, Cat. Shells U. S. p. 24. Reeve, Monog. Melania, sp. 77. Jay, Cat. Shells, 4th edit. p. 273. Binney, Check List, No. 37. Catlow, Conch. Nomenc., p. 185. Brot, List, p. 34.

Elimia Boykiniana, Lea, Chenu, Man. de Conchyl. i. f. 1978.

15. G. Bentoniensis, Lea.[¶]

Goniobasis Bentoniensis, Lea, Proc. Acad. Nat. Sci. p. 271, 1862. Jour. Acad. Nat. Sci. v. pt. 3, p. 336, t. 38, f. 198, March, 1863. Obs. ix. p. 158.

16. G. papillosa, Anthony.

Melania papillosa, Anthony, Reeve, Monog. Melania, sp. 467, May, 1861. Brot, List, p. 34.

Goniobasis Downieana, Lea, Proc. Acad. Nat. Sci. p. 272, 1862. Jour. Acad. Nat. Sci. v. pt. 3, p. 341, t. 38, f. 206, March, 1863. Obs. ix. p. 163.

17. G. Couperii, Lea.

Goniobasis Couperii, Lea, Proc. Acad. Nat. Sci. p. 271, 1862. Jour. Acad. Nat. Sci. v. pt. 3, p. 341, t. 38, f. 205, March, 1863. Obs. ix. p. 163.

18. G. inclinans, Lea.

Goniobasis inclinans, Lea, Proc. Acad. Nat. Sci. p. 267, 1862. Jour. Acad. Nat. Sci. v. pt. 3, p. 318, t. 37, f. 166, March, 1863. Obs. ix. p. 140.

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[*] [†] I have seen several author's examples of *catenaria*, and they uniformly represent shells not adult. As I have not seen specimens of *sublirata* and *Floridensis*, I rely on the figures and descriptions only, in considering them to be the adults of the same species.

[‡] *G. catenoides* may prove to be a variety only of *catenaria* and I at first united them, but I have recently come to the conclusion that they are distinct species, though nearly allied.

[§] I presume it was Mr. Lea's first intention to describe this species under the name of *Etowahensis*, as a specimen is before me which that gentlemen sent to Mr. Anthony under that name. This very specimen was sent to Mr. Reeve and published by him, prior to the publication of *Canbyi* by Mr. Lea.

It is extremely difficult to distinguish this species from varieties of *papillosa*, Anth.

[‖] Dr. Brot considers this a synonym of *Boykiniana*, but it is very different.

[¶] Doubtfully distinct from *papillosa*, Anth.

19. G. **Postellii**, Lea.
Melania Postellii, Lea, Proc. Acad. Nat. Sci. p. 166, July, 1858. Binney, Check List, No. 214. Brot, List, p. 34.
Melania Portellii, Lea, Reeve, Monog. Melania, sp. 427.
Goniobasis Postellii, Lea, Jour. Acad. Nat. Sci., v. pt. 3, p. 343, t. 38, f. 208, March, 1863. Obs. ix. p. 165.

20. G. **arachnoidea**, Anthony.
Melania arachnoidea, Anthony, Ann. Lyc. Nat. Hist. N. Y., vi. p. 95, t. 2, f. 14, March, 1854. Binney, Check List, No. 19. Brot, List, p. 34. Reeve, Monog. Melania, sp. 83.
Melania intertexta, Anthony,[*] Proc. Acad. Nat. Sci., p. 62, February, 1860. Binney, Check List, No. 151. Brot, List, p. 34. Reeve, Monog. Melani, sp. 296.

21. G. **Conradi**, Brot.[†]
Melania Conradi, Brot, List, p. 36.
Melania symmetrica, Conrad, Proc. Acad. Nat. Sci., iv. p. 155, Feb., 1849. Journ. Acad. Nat. Sci., i. pt. 4, p. 278, t. 38, f. 5, Jan., 1850. Binney, Check List, No. 260.

22. G. **carinifera**, Lam.
Melania carinifera, Lamarck, Anim. sans Vert. Deshayes, Anim. sans Vert., 2d edit., viii. p. 433. Wheatley, Cat. Shells U. S., p. 24. Binney, Check List, No. 48. Catlow, Conch. Nomenc., p. 185. Brot, List, p. 36. Reeve, Monog. Melania, sp. 273.
Melania bella,[‡] Conrad, New Fresh-Water Shells, Appendix, p. 6, t. 9, f. 4, 1834. Binney, Check List, No. 29. Brot, List, p. 36. Reeve, Monog. Melania, sp. 269.
Melania perangulata, Conrad, Proc. Acad. Nat. Sci., iv. p. 154, Feb., 1849. Jour. Acad. Nat. Sci., i. pt. 4, p. 278, t. 38, f. 6. Binney, Check List, No. 199. Brot, List, p. 36. Reeve, Monog. Melania, sp. 285.
Melania percarinata, Conrad. Proc. Acad. Nat. Sci., iv. p. 155, Feb., 1849. Jour. Acad. Nat. Sci., 2d ser., i. pt. 4, p. 278, t. 38, f. 10. Binney, Check List, No. 200. Brot, List, p. 36.
Melania nebulosa, Conrad, Proc. Acad. Nat. Sci., iv. p. 155, Feb., 1849. Jour. Acad. Nat. Sci., i. pt. 4, p. 278, t. 38, f. 9. Binney, Check List, No. 172. Brot, List, p. 36.
Melania bella-crenata, Haldeman, Monog. Limniades, No. 4, p. 3 of cover, Oct. 5, 1841. Jay, Cat., 4th ed., p. 273. Binney, Check List, No. 30. Brot, List, p. 36.
Melania monilifera, Anthony, Jay, Cat., 4th ed., p. 474.

C. *Shell plicate.*

23. G. **obesa**, Anthony.
Melania obesa, Anthony, Reeve, Monog. Melania, sp. 469, May, 1861. Brot, List, p. 33.

24. G. **blanda**, Lea.[§]
Melania blanda, Lea, Proc. Acad. Nat. Sci., p. 122, 1861.
Goniobasis blanda, Lea, Jour. Acad. Nat. Sci., v. pt. 3, p. 242, t. 35, f. 44, March, 1863. Obs. ix. p. 64, t. 35, f. 44.

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[*] Half-grown shell.

[†] Dr. Brot proposed the name *Conradi* for this species, as *symmetrica* is preoccupied by Prof. Haldeman. I doubt whether it is distinct from *G. carinifera*, Lam.

[‡] That all the species here quoted are synonyms of *carinifera* does not admit of doubt. The species is rather a variable one in respect of proportions and ornamentation.

[§] The name of this species must be changed because preoccupied by Mr. Lea himself.

25. G. **substricta**, Haldeman.*
Melania substricta, Haldeman, Monog. Limniades, vii. p. 4 of cover, Jany., 1844. Wheatley, Cat. Shells U. S., p. 27. Binney, Check List, No. 256. Brot, List, p. 36.

26. G. **aequalis**, Haldeman.†
Melania æqualis, Haldeman, Monog. Limniades, No. 4, p. 3 of cover, Oct. 5, 1841. Jay, Cat , 4th ed., p. 272. Binney, Check List, No. 7.

27. G. **semigradata**, Reeve.
Malania semigradata, Reeve, Moneg. Melania, sp. 472, May, 1861. Brot, List, p. 33.

28. G. **carinocostata**,‡ Lea.
Melania carinocostata, Lea, Philos. Proc., iv. p. 165, 1845. Philos. Trans., x. p. 62, t. 9, f. 40. Obs. iv. p. 62. Binney, Check List, No. 49. Brot, List, p. 35, Reeve, Monog. Melania, sp. 333.
Goniobasis strenua, Lea, Proc. Acad. Nat. Sci., p. 267, 1862. Jour. Acad. Nat. Sci., v. pt. 3, p. 316, t. 37, f. 161, March, 1863. Obs. ix. p. 138.
Goniobasis Leidyana, Lea, Proc. Acad. Nat. Sci., p. 268, 1862. Jour. Acad. Nat. Sci., v. pt. 3, p. 322, t. 38, f. 173, March, 1863. Obs. ix. p. 144.
Melania scabrella, Anthony, Reeve, Monog. Melania, sp. 388.
Melania scabriuscula, Brot, List, p. 36.

29. G. **Lecontiana**,§ Lea.
Melania Lecontiana, Lea, Philos. Proc., ii. p. 13, Feb. 1841. Philos. Trans., viii. p. 177, t. 5, f. 29. Dekay, Moll. N. York, p. 96. Wheatley, Cat. Shells U. S., p. 26. Brot, List, p. 35. Jay, Cat., 4th edit., p. 274. Binney, Check List, No. 160. Catlow, Conch. Nomenc., p. 187.
Melasma Lecontiana, Lea, Chenu, Man. Conchyl., i. f. 2002.

30. G. **cadus**, Lea.‖
Goniobasis cadus, Lea, Proc. Acad. Nat. Sci., p. 272, 1862. Jour. Acad. Nat. Sci., v. pt. 3, p. 345, t. 38, f. 211, March, 1863. Obs. ix. p. 167.

31. G. **obtusa**, Lea.¶
Melania obtusa, Lea, Philos. Proc., ii. p. 13, Feb., 1841. Philos. Trans., viii. p. 176, t. 5, f. 28. Obs. iii. p. 14. Dekay, Moll. New York, p. 96. Binney, Check List, No. 183. Troost, Cat. Shells Tennessee. Wheatley, Cat. Shells U. S., p. 26. Catlow, Conch. Nomenc., p. 188. Brot, List, p. 59.

32. G. **amoena**, Lea.
Goniobasis amœna, Lea, Proc. Acad. Nat. Sci., p. 268, 1862. Jour. Acad. Nat. Sci., v. pt. 3, p. 323, t. 38, f. 175, March, 1863. Obs. ix. p. 145, t. 38, f. 175.

33. G. **Tuomeyi**, Lea.
Goniobasis Tuomeyi, Lea, Proc. Acad. Nat. Sci., p. 266, 1862. Jour. Acad. Nat. Sci., v. pt. 3, p. 311, t. 37, f. 153, March, 1863. Obs. ix. p. 133.

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* Somewhat like *gracilis*, Lea, but is a stouter, more ponderous species.

† Allied to *carinocostata*, Lea, but in that species the plicæ are terminated by an acute angle or rib on the body whorl and the spire is angled or carinate.

‡ A very variable species. The *M. scabrella* of Anthony is a half-grown shell; in which state the plicæ and carinæ are more distinct than in the adult form. *Scabrella* being preoccupied by an European author, M. Brot changed the name to *scabriuscula*.

§ Mr. Reeve's figure 404 does not represent this species; it is nearer to *decorata*, Anthony. This shell is closely allied to *carinocostata* and *æqualis*.

‖ Allied to *G. obtusa*, but appears to differ in not being so closely plicate as that species. It may possibly = *Lecontiana*.

¶ Is this the young shell of *cadus* or *carinocostata?*

34. G. Christyi, Lea.
Goniobasis Christyi, Lea, Proc. Acad. Nat. Sci., p. 269, 1862. Jour. Acad. Nat. Sci., v. pt. 3, p. 328, t. 38, f. 185, March, 1863. Obs. ix. p. 150.
Goniobasis instabilis, Lea, Proc. Acad. Nat. Sci., p. 269, 1862. Jour. Acad. Nat. Sci., v. pt. 3, p. 329, t. 38, f. 186, March, 1863. Obs. ix, p. 151.

35. G. interveniens, Lea.*
Goniobasis interveniens, Lea, Proc. Acad. Nat. Sci., p. 268, 1862. Journ. Acad. Nat. Sci., v. pt. 3, p. 320, t. 38, f. 169, March, 1863. Obs. ix. p. 142.

36. G. olivella, Lea.
Goniobasis olivella, Lea, Proceed. Acad. Nat. Sci., p. 269, 1862. Journ. Acad. Nat. Sci., v. pt. 3, p. 327, t. 38, f. 182, March, 1863. Obs. ix. p. 149.

37. G. interrupta, Haldeman.
Melania interrupta, Haldeman, Supplement to No. 1, Monog. Limniades, Oct. 1840. Wheatley, Cat. Shells U. S., p. 25. Jay, Cat., 4t edit., p. 274. Brot, List, p. 34. Reeve, Monog. Melania, sp. 398.
Goniobasis ornatella, Lea, Proceed. Acad. Nat. Sci., p. 269, 1862. Journ. Acad. Nat. Sci., v. pt. 3, p. 326, t. 38, f. 181, March, 1863. Obs. ix. p. 148.

38. G. crispa, Lea.†
Goniobasis crispa, Lea, Proc. Acad. Nat. Sci., p. 269, 1862. Jour. Acad. Nat. Sci., v. pt. 3, p. 326, t. 38, f. 180, March, 1863. Obs. ix. p. 148.

39. G. formosa, Conrad.‡
Melania formosa, Conrad, New Fresh-Water Shells, Appendix, p. 5, t. 9, f. 3, 1834. Wheatley, Cat. Shells U. S., p. 25. Binney, Check List, No. 112.
Melania formosa, Anthony, Reeve, Monog. Melania, sp. 387. Brot, List, p. 35.

40. G. mediocris, Lea.
Goniobasis mediocris, Lea, Proceed. Acad. Nat. Sci., p. 269, 1862. Journ. Acad. Nat. Sci., v. pt. 3, p. 326, t. 38, f. 179, March, 1863. Obs. ix. p. 148.

41. G vesicula, Lea.
Melania vesicula, Lea, Proc. Acad. Nat. Sci., p. 118, 1861.
Goniobasis vesicula, Lea, Jour. Acad. Nat. Sci., v. pt. 3, p. 242, t. 35, f. 45, March, 1863. Obs. ix. p. 64.

42. G. Duttonii, Lea.§
Goniobasis Duttonii, Lea, Proceed. Acad. Nat. Sci., p. 266, 1862. Journ. Acad. Nat. Sci., v. pt. 3, p. 314, t. 37, f. 158, March, 1863. Obs. ix. p. 136.

43. G. laqueata, Say.
Melania laqueata, Say, New Harmony Disseminator, p. 275, September, 1829. Say's Reprint, p. 17. American Conchology, No. 5, t. 47, f. 1. Binney's edition, pp. 143 and 200. Binney, Check List, No. 158. De-Kay, Moll. New York, p. 97. Wheatley, Cat. Shells U. S., p. 25. Jay, Cat., 4th ed., p. 274. Reeve, Monog. Melania, sp. 281, 288? Brot, List, p. 35. Catlow, Conch. Nomenc., p. 187.

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* Very like *Curreyana*, Lea, in the plicæ, but differs in form.

† More convex and with more regular striæ than *G. nassula*. Conrad.

‡ Close to *G. nassula*, Conrad, but is striate, and the aperture is more rounded.

§ Differs from *G. Tuomeyi*, Lea, in the form of the aperture. The specimens before me are not all two-banded, some of them being without bands, and of a light yellowish color.

Melania monozonalis,* Lea, Philos. Proc., ii. p. 13, February, 1841. Philos. Trans., viii. p. 178, t. 6, f. 31. Obs. iii. p. 16. DeKay, Moll. New York, p. 96. Binney, Check List, No. 168. Troost, Cat. Shells Tennessee. Wheatley, Cat. Shells U. S., p. 26. Catlow, Conch. Nomenc., p. 187. Brot, List, p. 40.

44. G. Pybasii, Lea.
Goniobasis Pybasii, Lea, Proc. Acad. Nat. Sci., p. 266, 1862. Jour. Acad. Nat. Sci., v. pt. 3, p. 318, t. 37, f. 157, March, 1863. Obs., ix. p. 135, t. 37, f. 157.

45. G. induta, Lea.
Goniobasis induta, Lea, Proc. Acad. Nat. Sci., p. 267, 1862. Jour. Acad. Nat. Sci., v. pt. 3, p. 319, t. 37, f. 166, March, 1863. Obs., ix. p. 141.

46. G. versipellis,† Anthony.
Melania versipellis, Anthony, Proc. Acad. Nat. Sci., p. 60, February, 1860. Binney, Check List, No. 286. Brot, List, p. 59. Reeve, Monog. Melania, sp. 436.

47. G. gracilis,‡ Lea.
Melania gracilis, Lea, Philos. Proc., ii. p. 12, Feb. 1841. Philos. Trans., viii. p. 168, t. 5, f. 11. Obs. iii. p. 6. DeKay, Moll. N. York, p. 94. Troost, Cat. Shells Tenn. Wheatley, Cat. Shells U. S., p. 25. Binney, Check List, No. 128. Catlow, Conch. Nomenc., p. 187. Brot, List, p. 38.
Potadoma gracilis, Lea, Chenu, Manuel de Conchyl., i. f. 1968.

48. G. paucicosta, Anthony.
Melania paucicosta, Anthony, Proc. Acad. Nat. Sci., p. 57, February, 1860. Binney, Check List, No. 196. Brot, List, p. 36. Reeve, Monog. Melania, sp. 255.

49. G. tenebrosa, Lea.
Melania tenebrosa, Lea, Philos. Proc., ii. p. 13, February, 1841. Philos. Trans., viii. p. 176, t. 5, f. 26. Obs. iii. p. 14. DeKay, Moll. N. Y., p. 95. Troost, Cat. Shells Tenn. Wheatley, Cat. Shells U. S., p. 27. Binney, Check List, No. 267. Catlow, Conch. Nomenc., p. 189. Reeve, Monog. Melania, sp. 443. Brot, List, p. 39.

50. G. coracina, Anthony.
Melania coracina, Anthony, Bost. Proc., iii. p. 361, Dec., 1850. Binney, Check List, No. 67. Brot, List, p. 58.
Melania Sellersiana, Lea, Philos. Trans., x. p. 299, t. 30, f. 8. Obs., v. p. 55. Binney, Check List, No. 239.

51. G. intersita, Haldeman.
Melania intersita, Haldeman, Monog. Limniades, No. 4, p. 4 of cover, Dec. 28, 1841. Binney, Check List, No. 150. Brot, List, p. 35. Reeve, Monog. Melania, sp. 376.

52. G. columella, Lea.
Melania columella, Lea, Philos. Proc., ii. p. 13, Feb., 1841. Philos. Trans., viii. p. 179, t. 6, f. 33. Obs. iii. p. 17. DeKay, Moll. N. Y., p. 96. Binney, Check List, No. 60. Troost, Cat. Shells Tenn. Wheatley, Cat. Shells U. S., p. 24. Catlow, Conch. Nomenc., p. 186. Brot, List, p. 35. Reeve, Monog. Melania, sp. 441.

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*This is only a rather wide, young specimen of *laqueata*, as I have ascertained by the inspection of some hundreds of specimens of that species.

† *Versipellis* resembles a young *laqueata*, but its texture is quite heavy although small.

‡ Described by Mr. Lea as a smooth species, but among a hundred perfect specimens before me, over eighty are more or less plicate on the spire.

53. G. blanda, Lea.

Melania blanda, Lea, Philos. Proc., ii. p. 13, Feb. 1841. Philos. Trans., viii. p. 79, t. 6, f. 34. Obs. iii. p. 17. DeKay, Moll. N. Y., p. 97. Binney, Check List, No. 36. Troost, Cat. Shells Tennessee. Wheatley, Cat. Shells U. S., p. 24. Catlow, Conch. Nomenc., p. 185. Brot, List, p. 35.

54. G. nitens, Lea.

Melania nitida,[*] Lea, Philos. Proc., ii. p. 14, February, 1841.

Melania nitens, Lea, Philos. Trans., viii. p. 182, t. 6, f. 40. Obs. iii. p. 20. DeKay, Moll. N. Y., p. 98. Binney, Check List, No. 178. Troost, Cat. Shells Tennessee. Wheatley, Cat. Shells U. S., p. 26. Catlow, Conch. Nomenc., p. 187. Brot, List, p. 36.

55. G. mutata, Brot.

Melania Deshayesiana,[†] Reeve, Monog. Melania, sp. 278, September, 1860.

Melania mutata, Brot, List, p. 37.

56. G. suturalis, Haldeman.

Melania suturalis, Haldeman, Suplement to Monog. Limniades, No. 1, Oct., 1840. Wheatley, Cat. Shells U. S., p. 27. Jay, Cat., 4th ed., p. 275.

57. G. mutabilis,[‡] Lea.

Goniobasis mutabilis, Lea, Proc. Acad. Nat. Sci., p. 270, 1862. Jour. Acad. Nat. Sci., v. pt. 3, p. 331, t. 38, f. 189, March, 1863. Obs., ix. p. 153.

58. G. Viennaensis, Lea.

Goniobasis Viennaensis, Lea, Proc. Acad. Nat. Sci., p. 267, 1862. Jour. Acad. Nat. Sci., v. pt. 3, p. 315, t. 37, f. 160, March, 1863. Obs., ix. p. 137.

59. G. Curreyana, Lea.

Goniobasis Curreyana, Lea, Philos. Proc., ii. p. 13, Feb. 1841. Philos. Trans., viii. p. 180, t. 6, f. 36. Obs., iii. p 18. Wheatley, Cat. Shells U. S., p. 25. Binney, Check List, No. 79. DeKay, Moll. N. Y., p. 97. Reeve, Monog. Melania, sp. 286. Troost, Cat. Shells, Tennessee. Catlow, Conch. Nomenc., p. 186. Brot. List, p. 35.

Melasma Curreyana, Lea, Chenu, Man. de Conchyl. i. f. 2003.

60. G. costifera,[§] Haldeman.

Melania costifera, Haldeman, Monog. Melania., No. 2, p. 3 of Cover, Jan. 1841. Binney, Check List, No. 72. Brot, List, p. 34. Reeve, Monog. Melania, sp. 440.

61. G. Deshayesiana, Lea.

Melania plicatula,[‖] Lea, Proc. Philos. Soc., ii. p. 14, Feb. 1841. Philos. Trans., viii. p. 182, t. 6, f. 41. Obs., iii. p. 20. Troost, Cat. Shells Tenn. Jay, Cat., 4th Edit., p. 274. Catlow, Conch. Nomenc., p. 188. Brot, List, p. 34.

Melasma plicatula, Lea, Chenu, Man. de Conchyl. i. f. 1998.

Melania Deshayesiana, Lea, Philos. Proc., ii. p. 242, Dec. 1842. Philos. Trans., ix. p. 24. Obs., ix. p. 24. DeKay, Moll. N. Y. p. 98. Wheatley, Cat. Shells U. S., p. 25. Troost, Cat. Shells Tennessee. Jay, Cat. Shells, 4th Edit., p. 273. Binney, Check List, No. 88. Brot, List, p. 34.

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[*] Preoccupied.

[†] Preoccupied by Mr. Lea, and the name changed to *mutata* by M. Brot

[‡] Very closely allied to *suturalis*, but differs in the form of the aperture.

[§] Differs from *Curreyana* by its more numerous plicæ, more acuminated spire, and by the mouth being more rounded at base.

[‖] Preoccupied, and changed to *Deshayesiana*.

Melania Deshaysii, Lea, Reeve, Monog. Melania, sp. 330.

62. G. Abbevillensis, Lea.
Goniobasis Abbevillensis, Lea, Proc. Acad. Nat. Sci., p. 268, 1862. Journ. Acad. Nat. Sci. v. pt. 3, p. 323, t. 38, f. 174, Mar. 1863. Obs., ix. p. 145.

63. G. Doolyensis, Lea.
Goniobasis Doolyensis, Lea, Proc. Acad. Nat. Sci., p. 266, 1862. Jour. Acad. Nat. Sci., v. pt. 3, p. 315 t. 37, f. 159., Mar. 1863. Obs., ix. p. 137.

64. G. inconstans,[‡] Lea.
Goniobasis inconstans, Lea, Proc. Acad. Nat. Sci., p. 269, 1862. Jour. Acad. Nat. Sci., v. pt. 3, p. 325, t. 38, f. 178, Mar. 1863. Obs., ix. p. 147.

65. G. continens, Lea.
Goniobasis continens, Lea, Proc. Acad. Nat. Sci., p. 268, 1862. Jour. Acad. Nat. Sci., pt. 3, p. 324, t. 38, f. 176. Mar. 1863. Obs., ix. p. 146.
Goniobasis proletaria, Lea, Proc. Acad. Nat. Sci., p. 268, 1862. Jour. Acad. Sci., v. pt. 3, p. 325, t. 38, f, 177, Mar. 1863. Obs., ix, p. 147.

66. G. viridicata, Lea.
Goniobasis viridicata, Lea, Proc. Acad. Nat, Sci., p. 268, 1862. Jour. Acad. Nat. Sci., v. pt. 3, p. 322, t. 38, f. 172, Mar, 1863. Obs., ix. p. 144.

67. G. purpurella, Lea.
Giniobasis purpurella, Lea, Proc. Acad. Nat. Sci., p. 269, 1862. Jour. Acad. Nat. Sci., v. pt. 3, p. 327, t. 38, f, 183, Mar. 1863. Obs., ix. p. 149.

68. semicostata, Conrad.
Melania semicostata, Conrad, New Fresh-Water Shells, App. p. 7, t. 9, f. 6, 1834. Binney, Check List, No. 241. Brot, List, p. 59.

69. G. dislocata, Ravenel.
Melania dislocata, Ravenel, Cat. Shells, p. 11, 1834. Binney, Check List, No. 90. Brot, List, p. 35. Reeve, Monog. Melania, sp. 380.
Goniobasis Lindsleyi, Lea, Proc. Acad. Nat. Sci., p. 267, 1862. Jour. Acad. Nat. Sci., v. pt. 3, p. 319, t. 37, f. 167, Mar. 1863. Obs. ix. p. 141.

70. G. paupercula,[§] Lea.
Goniobasis paupercula, Lea, Proc. Acad. Nat Sci., p. 268, 1862. Jour. Acad. Nat. Sci., v. pt. 3, p. 324, t. 38, f. 176, Mar. 1863. Obs. ix., p. 146.

71. G. corneola, Anthony.
Melania corneola, Anthony, Proc. Acad. Nat. Sci., p. 61, Feb. 1860. Binney, Check List, No. 68. Brot, List, p. 35. Reeve, Monog. Melania, sp. 456.

72. G. nassula, Conrad.
Melania nassula, Conrad, New Fresh-Water Shells, p. 55, t. 8, f. 9, 1834. Binney, Check List, No. 171. DeKay, Moll. New York, p. 97. Jay, Cat. 4th Edit., p. 274. Wheatley, Cat. Shells U. S., p. 26. Brot, List, p. 34. Reeve, Monog. Melania, sp. 412. Catlow, Conch. Nomenc., p. 187.

73. G. perstriata, Lea.
Melania perstriata, Lea, Philos. Trans., x. p. 296, t. 30, f. 2. Obs., v. p. 52. Binney. Check List, No. 203. Brot, List, p. 36.

[‡] I doubt whether this is more than the young of *Doolyensis*.
[§] = *dislocata*, young?

74. G. rugosa, Lea.
Melania corrugata, Lea, Philos. Proc. ii. p. 13, Feb. 1841. Philos. Trans. viii. p. 177, t. 5, f. 30. Obs., iii. p. 15. Troost, Cat. Shells Tenn. Wheatley, Cat. Shells U. S., p. 24.
Melania rugosa,* Lea, Philos. Proc. ii. p. 237, Dec. 1842. Philos. Trans. viii. p. 248. Obs., iii. p. 86. DeKay, Moll. New York, p. 96. Binney, Check List, No. 235. Catlow, Conch. Nomenc., p. 188. Brot, List, p. 34.

75. G. costulata, Lea.
Melania costulata, Lea, Philos. Proc., ii. p. 14, Feb. 1841. Philos. Trans. viii. p. 181, t. 6, f. 39. Obs., iii. p. 19. Binney, Check List, No. 73. DeKay, Moll. N. Y., p. 98. Jay, Cat. 4th Edit., p. 273. Troost, Cat. Shells Tennessee. Wheatley, Cat. Shells U. S., p. 24. Reeve, Monog. Melania, sp. 272, 360. Brot, List, p. 35.

76. G. cinerella, Lea.
Goniobasis cinerella, Lea, Proc. Acad. Nat. Sci., p. 269, 1862. Jour. Acad. Nat. Sci., v. pt. 3, p. 328, t. 38, f. 184, Mar. 1863. Obs., ix. p. 150.

77. G. Edgariana, Lea.
Melania Edgariana, Lea, Philos. Proc., ii. p. 14, Feb. 1841. Philos. Trans., viii. p. 180, t. 6, f. 37. Obs., iii. p. 18. DeKay, Moll. N. Y., p. 97. Jay, Cat. 4th Edit., p. 273. Binney, Check List, No. 94. Troost, Cat. Shells Tenn. Reeve, Monog. Melania, sp. 430. Wheatley, Cat. Shells U. S., p. 25. Catlow, Conch. Nomenc., p. 186.
Melasma Edgariana, Lea, Chenu, Man. de Conchyl, i. f. 1997.

78. G. caliginosa, Lea.
Melania caliginosa, Lea, Philos. Proc. ii. p. 15, Feb. 1841. Philos. Trans., viii. p. 189, t, 6, f. 56. Obs., iii. p. 27. Wheatley, Cat. Shells U. S., p. 24. Reeve, Monog. Melania, sp. 293. DeKay, Moll. New York, p. 100. Binney, Check List, No. 44. Troost, Cat. Shells Tenn. Jay, Cat. 4th Edit., p. 273. Catlow, Conch. Nomenc. p. 185. Brot, List, p. 34.

79. G. nodulosa, Lea.
Melania nodulosa, Lea, Philos. Proc. ii. p. 15, Feb. 1841. Philos. Trans., viii. p. 190, t. 6, f. 57. Obs., iii. p. 28. DeKay, Moll. N. Y., p. 100. Binney, Check List, No. 180. Troost, Cat. Shells Tennessee. Wheatley, Cat. Shells U. S., p. 26. Catlow, Conch. Nomenc. p. 188. Brot, List, p. 34. Reeve, Monog. Melania, sp. 276.

80. G. glauca, Anthony.
Melania glauca, Anthony, Proc. Acad. Nat. Sci., p. 57, Feb. 1860. Binney, Check List, No. 125. Brot, List, p. 35. Reeve, Monog. Melania, sp. 389.
Goniobasis Lyonii, Lea. Proc. Acad. Nat. Sci., p. 266. Jour. Acad. Nat. Sci., v. pt. 3, p. 313, t. 37, f. 156, Mar. 1863. Obs., ix. p. 135.

81. G. difficilis,† Lea.
Goniobasis difficilis, Lea, Proc. Acad. Nat. Sci. p. 267, 1862. Jour. Acad. Nat. Sci., v. pt. 3, p. 317, t. 37. f, 163, Mar. 1863. Obs., ix. p. 139.

82. G. sparus, Lea.
Goniobasis sparus, Lea, Proc. Acad. Nat. Sci., p. 267, 1862. Jour. Acad. Nat. Sci., v. pt. 3, p. 316, t. 37, f. 162, Mar. 1863. Obs., ix, p. 138.
Goniobasis cerea, Lea, Proc. Acad. Nat. Sci., p. 268, 1862. Jour. Acad. Nat. Sci., v. pt. 3, p. 321, t. 38, f. 171, Mar. 1863. Obs. ix. p. 143.

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* Preoccupied.

† Resembles *G. glauca*, but the whorls are more convex. *G. baculum* is more cylindrical than this species.

83. G. Thorntonii, Lea.
Goniobasis Thorntonii, Lea, Proc. Acad. Nat. Sci., p. 268, 1862. Jour. Acad. Nat. Sci., v. pt. 3, p. 320, t. 38, *f.* 168, Mar. 1863. Obs., ix. p. 142.

84. G. cancellata,* Say.
Melania cancellata, Say, New Harmony Disseminator, p. 260, Aug. 1829. Say's Reprint, p. 16. Binney's Edit., p. 141. Binney, Check List, No. 46. DeKay, Moll. N. Y., p. 93. Wheatley, Cat. Shells U. S., p. 24. Brot, List, p. 34.

85. G. circincta, Lea.
Melania circincta, Lea, Philos. Proc. ii. p. 15, Feb. 1841. Philos. Trans., viii. p. 187, t. 6, f. 51. Obs., iii. p. 25. DeKay, Moll., N. Y., p. 99. Troost, Cat. Shells Tenn. Wheatley, Cat. Shells U. S., p. 24. Catlow, Conch. Nomenc., p. 186. Brot, List, p. 31. Reeve, Monog. Melania, sp. 289.
Melania circinnata, Lea, Binney, Check List, No. 54.
Juga circinnata, Lea, Chenu, Man. de Conchyl., i. f. 2015.

86. G. athleta, Anthony.
Melania athleta, Anthony, Ann. Lyc. Nat. Hist. N. Y., vi. p. 83, t. 2, f. 1, Mar. 1854. Binney, Check List, No. 23. Brot, List, p. 34. Reeve, Monog. Mel., sp. 258.

87. G. curvicostata, Anthony.
Melania curvicostata, Anthony, MSS. Reeve, Monog. Melania, sp. 462. Brot, List, p. 35.
Melania densecostata, Reeve, Monog. Melania, sp. 465. Brot, List, p. 35.

88. G. striatula, Lea.
Melania striata,† Lea, Philos. Proc. ii. p. 15, Feb. 1841. Philos. Trans., viii. p. 186, t. 6. f. 49. Obs., iii. p. 24. Troost, Cat. Shells Tenn. Wheatley, Cat. Shells U. S., p. .
Juga striata, Lea, Chenu. Man. de Conchyl. i. f. 2018.
Melania striatula, Lea, Philos. Proc. ii. p. 237, Dec. 1842. Philos. Trans. viii. p. 248. Obs. iii. p. 86. DeKay, Moll. New York, p. 99. Jay. Cat. 4th Edit., p. 275. Binney, Check List, No. 249. Catlow, Conch. Nomenc. p. 188. Reeve, Monog. Melania, sp. 466. Brot, List, p. 35.

89. G. tripartita, Reeve.
Melania tripartita, Reeve, Monog. Melania, sp. 364, Dec. 1860. Brot, List, p. 37.

90. G. decora, Lea.
Melania decora, Lea, Philos. Proc. ii. p. 14, Feb. 1841. Philos. Trans., viii. p. 181, t. 6, f. 38. Obs., iii. p. 19. DeKay, Moll. N. Y., p. 98. Binney, Check List, No. 85. Troost, Cat. Shells Tenn. Wheatley, Cat. Shells U. S., p. 25. Reeve, Monog. Melania, sp. 292. Catlow, Conch. Nomenc. p. 186. Brot, List, p. 35.

91. G. crebricostata, Lea.
Melania crebricostata, Lea, Philos. Proc. ii. p. 13, Feb. 1841. Philos. Trans., viii. p. 179, t. 6, f. 35. Obs., iii. p. 17. DeKay, Moll. New York, p. 97. Jay, Cat. 4th Edit., p. 273. Troost, Cat. Shells Tenn. Wheatley Cat. Shells U. S., p. 24. Reeve, Monog. Melania, sp. 374. Binney, Check List, No. 74. Brot, List, p. 35.
Melasma crebricostata, Lea, Chenu, Man. de Conchyl. i. f. 1999.

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* I am unable to find specimens of this shell in any of our cabinets, and as it has never been figured, I assign it the position it occupies in this catalogue from the description only.

† Name preoccupied.

92. G. comma, Conrad.
Melania comma, Conrad, New Fresh Water Shells, p. 53, t. 8, f. 7, 1834. Wheatley, Cat. Shells U. S., p. 24. Reeve, Monog. Melania, sp. 107. Binney, Check List, No. 61. DeKay, Moll. New York, p. 95. Jay, Cat. 4th Edit., p. 273. Brot, List, p. 35. Catlow, Conch. Nomenc. p. 186.

93. G. acuta, Lea.
Melania acuta, Lea. Philos. Trans., iv. p. 101, t. 15, f. 32. Obs. i. p. iii. Troost, Cat. Shells Tennessee. Wheatley, Cat. Shells U. S., p. 24. Binney, Check List, No. 4. Brot, List, p. 3. Reeve, Monog, Melania, sp. 274.

94. G. subcylindracea, Lea.
Melania subcylindracea, Lea, Philos. Proc. ii. p. 12, Feb. 1841. Philos. Trans., viii. p. 169, t. 5, f. 14. Obs., iii. p. 7. DeKay, Moll. New York, p. 94. Troost, Cat. Shells Tenn. Binney, Check List, No. 253. Wheatley, Cat. Shells U. S., p. 27. Catlow, Conch. Nomenc. p. 188. Brot, List, p. 39. Reeve, Monog. Melania, sp. 399.

95. G. baculum, Anthony.
Melania baculum, Anthony, Ann. N. Y. Lyc. Nat. Hist. vi. p. 98, t. 2. f. 16, Mar. 1854. Binney, Check List, No. 27. Brot, List, p. 34. Reeve, Monog. Melania, sp. 431.

96. G. concinna,* Lea.
Melania concinna, Lea, Philos. Proc. ii. p. 14, Feb. 1841. Philos. Trans., viii. p. 183, t. 6, f. 42. Obs. iii., p. 21. DeKay, Moll. New York, p. 98. Troost, Cat. Shells Tennessee. Wheatley, Cat. Shells U. S., p. 24. Catlow, Conch. Nomenc. p. 186. Binney, Check List, No. 63. Brot, List, p. 34.

97. G. eliminata, Anthony,
Melania eliminata, Anthony, Ann. New York Lyc. Nat. Hist., vi., p. 97, t. 2, f. 15, Mar. 1854. Binney, Check List, No. 98. Brot, List, p. 34.

98. G. teres, Lea.
Melania teres, Lea, Philos. Proc., ii. p. 13, Feb. 1841. Philos. Trans.. viii. p. 176, t. 5, f. 27. Obs., iii. p. 14. DeKay, Moll. New York, p. 96. Troost, Cat. Shells Tenn. Wheatley, Cat. Shells U. S., p. 27. Binney, Check List, No. 269. Jay, Cat. 4th Edit., p. 275. Catlow, Conch. Nomenc. p. 189. Brot, List, p. 35.
Melania terebralis,† Lea, Philos. Proc., ii, p. 13, Feb. 1841. Philos. Trans., viii. p, 178, t. 6, f. 32. Obs., iii. p. 16. DeKay, Moll. New York, p. 96. Troost, Cat. Shells Tenn. Wheatley, Cat. Shells U. S., p. 27. Binney, Check List, No. 268. Catlow, Conch. Nomenc. p. 189. Brot, List, p. 36.

99. G. gracillima, Anthony.
Melania gracillima, Anthony, Proc. Acad. Nat. Sci., p. 62, Feb. 1860. Binney, Check List, No. 129. Brot, List, p. 36. Reeve, Monog. Melania, sp. 437.

100. G. Clarkii, Lea.
Melania Clarkii, Lea, Philos. Trans., x. p. 297, t. 30, f. 4. Obs., v. p. 53. Binney, Check List, No. 56. Brot, List, p. 34. Reeve, Monog. Melania, sp. 356.

101. G. DeCampii, Lea.
Goniobasis DeCampii, Lea, Proc. Acad. Nat. Sci., p. 154, May, 1863.

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* Extensively distributed by Mr. Anthony as *M. comma*, Conrad, variety.
† Half grown shell of *G. teres*.

102. G. abbreviata, Anthony.

Melania abbreviata, Anthony, Bost. Proc., iii. p. 360, Dec., 1850. Binney, Check List, No. 4. Reeve, Monog. Melania, sp. 424.

Melania elegantula, Anthony, Ann. Lyc. Nat. Hist. N. Y., vi. p. 103, t. 3, f. 2, March, 1854. Binney, Check List, No. 96. Brot, List, p. 32. Reeve, Monog. Melania, sp. 346.

Melania coronilla, Anthony, Ann. Lyc. Nat. Hist. N. Y., vi. p. 126, t. 3, f. 27, March, 1854. Binney, Check List, No. 69. Brot, List, p. 32. Reeve, Monog. Melania, sp. 418.

Melania chalybæa, Anthony, Brot, List, p. 37.

103. G. plicifera, Lea.

Melania plicifera, Lea, Philos. Trans. vi. p. 93, t. 23, f. 90. Obs. ii. p. 93. Wheatley, Cat. Shells U. S., p. 26. Jay, Cat., 4th ed., p. 274. Binney, Check List, No. 211. Reeve, Monog. Melania, sp. 284. Cooper, Report, p. 374. Brot, List, p. 36. Gould, Moll. Expl. Exped., p. 143, f. 165.

Melasma plicifera, Lea, Chenu, Manuel, i. f. 2001.

104. G. silicula, Gould.

Melania silicula, Gould, Bost. Proc., ii. p. 224, June, 1847. Otia Conchologica, p. 46. Moll. Expl. Exped., p. 141, f. 164, 164a. Cooper, Report, p. 374. Binney, Check List, No. 243. Brot, List, p. 52.

Melania Shastaensis, Lea, Proc. Acad. Nat. Sci., viii. p. 80, April, 1856. Binney, Check List, No. 242. Cooper, Report, p. 374.

Goniobasis Shastaensis, Lea, Jour. Acad. Nat. Sci., v. pt. 3, p. 337, t. 38, f. 199, March, 1863. Obs. ix. p. 159.

Melania rudens, Reeve, Monog. Melania, sp. 224, May, 1860. Brot, List, p.

105. G. nigrina,* Lea.

Melania nigrina, Lea, Proc. Acad. Nat. Sci., p. 80, April, 1856.

Goniobasis nigrina, Lea, Jour. Acad. Nat. Sci., v. pt. 3, p. 302, t. 37, f. 137, March, 1863. Obs. ix. p. 124. Binney, Check List, No. 177.

106. G. rubiginosa, Lea.

Goniobasis rubiginosa, Lea, Proceed. Acad. Nat. Sci., p. 270, 1862. Journ. Acad. Nat. Sci., v. pt. 3, p. 333, t. 38, f. 193, March, 1863. Obs. ix. p. 155.

107. G. Bairdiana, Lea.

Goniobasis Bairdiana, Lea, Proc. Acad. Nat. Sci., p. 267, 1862. Jour. Acad. Nat. Sci., v. pt. 3, p. 317, t. 37, f. 164, March, 1863. Obs. ix. p. 139, t. 37, f. 164.

D. *Shell angulate.*

108. G. trochiformis,† Conrad.

Melania trochiformis, Conrad, New Fresh-Water Shells, p. 56, t. 8, f. 11, 1834. DeKay, Moll. New York, p. 100. Wheatley, Cat. Shells U. S., p. 27. Binney, Check List, No. 275. Brot, List, p. 31.

109. G. cristata,‡ Anthony.

Melania cristata, Anthony, Ann. Lyc. Nat. Hist. N. Y., vi. p. 108, t. 3, f. 8, March, 1854. Binney, Check List, No. 77. Brot, List, p. 32. Reeve, Monog. Melania, sp. 413.

110. G. cruda, Lea.

Goniobasis cruda, Lea, Proc. Acad. Nat. Sci., p. 270, 1862. Jour. Acad. Nat. Sci., v. pt. 3, p. 332, t. 38, f. 190, March, 1863. Obs. ix. p. 154.

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* Differs from *silicula* in being more cylindrical, with the apical whorls carinate.

† The figure of this species in Mr. Conrad's work is not recognizable, but it will probably be found to = *cristata*, Anth., young.

‡ = *proteus*, Lea?

111. G. Whitei, Lea.
Goniobasis Whitei, Lea, Proc. Acad. Nat. Sci., p. 266, 1862. Jour. Acad. Nat. Sci., v. pt. 3, p. 310, t. 37, f. 151, March, 1863. Obs. ix. p. 132.

112. G. casta, Anthony.
Melania casta, Anthony, Ann. N. Y. Lyc. Nat. Hist., vi. p. 100, t. 2, f. 19, March, 1854. Binney, Check List, No. 50. Brot, List, p. 32. Reeve, Monog. Melania, sp. 381.

113. G. rhombica, Anthony.
Melania rhombica, Anthony, Ann. N. Y. Lyc. Nat. Hist., vi. p. 116, t. 3, f. 16, March, 1854. Binney, Check List, No. 228. Brot, List, p. 38. Reeve, Monog. Melania, sp. 347.

114. G. angulata, Anthony.
Melania angulata,[*] Anthony, Ann. N. Y. Lyc. Nat. Hist., vi. p. 117, t. 3, f. 17, March, 1854. Binney, Check List, No. 14. Brot, List, p. 37. Reeve, Monog. Melania, sp. 386.
Melania cinnamomea, Anthony, Reeve, Monog. Melania, sp. 379. Brot, List, p. 35.
Goniobasis intercedens, Lea, Proceed. Acad. Nat. Sci., p. 265, 1862. Journ. Acad. Nat. Sci., v. pt. 3, p. 305, t. 37, f. 143. Obs. ix. p. 127.

115. G. Bridgesiana, Lea.
Goniobasis Bridgesiana, Lea, Proc. Acad. Nat. Sci., p. 265, 1862. Jour. Acad. Nat. Sci., v. pt. 3, p. 305, t. 37, f. 142, March, 1863. Obs. ix. p. 173, t. 37, f. 142.

116. G. cubicoides, Anthony.
Melania cubicoides,[†] Anthony, Proc. Acad. Nat. Sci., p. 60, Feb., 1860. Binney, Check List, No. 78. Brot, List, p. 39. Reeve, Monog. Melania, sp. 445.

117. G. Spillmanii, Lea.
Goniobasis Spillmanii, Lea, Proceed. Acad. Nat. Sci., p. 264, 1862. Journ. Acad. Nat. Sci., v. pt. 3, p. 302, t. 37, f. 138, March, 1863. Obs. ix. p. 124.

118. G. plebeius, Anthony.
Melania plebejus, Anthony, Bost. Proc., iii. p. 362, Dec., 1850. Reeve, Monog. Melania, sp. 414.
Melania plebeius, Anthony, Binney, Check List, No. 209.
Melania plebeia, Anthony, Brot, List, p. 38.

119. G. opaca,[‡] Anthony.
Melania opaca, Anthony, Proc. Acad. Nat. Sci., p. 58, Feb., 1860. Binney, Check List, No. 189. Brot, List, p. 38. Reeve, Monog. Melania, sp. 384.
Melania iostoma, Anthony, Proc. Acad. Nat. Sci., p. 62, February, 1860. Binney, Check List, No. 152. Brot, List, p. 31. Reeve, Monog. Melania, sp. 351.
Melania nigrostoma,[§] Anthony, Reeve, Monog. Melania, sp. 463, 367. Brot, List, p. 38.

120. G. pallidula, Anthony.
Melania pallidula, Anthony, Ann. N. Y. Lyc. Nat. Hist., vi. p. 115, t. 3, f. 15, March, 1854. Binney, Check List, No. 197. Brot, List, p. 38. Reeve, Monog. Melania, sp. 417.

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[*] Juvenile shell. The adult is described under the names of *cinnamomea* and *intercedens*.

[†] The longitudinal ribs attributed to this species by Mr. Anthony are very faint on the type shell, and do not exist at all on other specimens.

[‡] = *ovoidea*, Lea. ? *G. ebenum* of Lea appears to be more rounded in the base of the aperture, and the periphery not angulated; still it may be the same.

[§] Young specimens.

121. G. vicina,[*] Anthony.
Melania vicina, Anthony, Ann. N. Y. Lyc. Nat. Hist., vi. p. 114, t. 3, f. 14, March, 1854. Binney, Check List, No. 288. Brot, List, p. 39. Reeve, Monog. Melania, sp. 291.

122. G. Spartenburgensis,[†] Lea.
Goniobasis Spartenburgensis, Lea, Proc. Acad. Nat. Sci., p. 265, 1862. Jour. Acad. Nat. Sci., 2d ser., v. pt. 3, p. 307, t. 37, f. 147, March, 1863. Obs. ix. p. 129.

123. G. modesta, Lea.
Melania modesta, Lea, Philos. Proc., iv. p. 166, Aug., 1845. Philos. Trans., x. p. 60, t. 9, f. 34. Obs. iv. p. 60. Binney, Check List, p. 36.

E. *Whorls very strongly carinated.*

124. G. pagodiformis, Anthony.
Melania pagodiformis, Anthony, Ann. N. Y. Lyc. Nat. Hist., vi. p. 106, t. 3, f. 6, March, 1854. Binney, Check List, No. 195. Brot, List, p. 36. Reeve, Monog. Melania, sp. 260.
Melania torulosa, Anthony, Ann. N. Y. Lyc. Nat. Hist., vi. p. 110, t. 3, f. 10. March, 1854. Binney, Check List, No. 273. Brot, List, p. 37. Reeve, Monog. Melania, sp. 370.

125. G. Gerhardtii, Lea.
Goniobasis Gerhardtii, Lea, Proceed. Acad. Nat. Sci., p. 270, 1862. Journ. Acad. Nat. Sci., v. pt. 3, p. 330, t. 38, f. 187, March, 1863. Obs., ix. p. 152.
Goniobasis infuscata, Lea, Proceed. Acad. Nat. Sci., p. 270, 1862. Journ. Acad. Nat. Sci., v. pt. 3, p. 330, t. 38, f. 188, March, 1863. Obs. ix. p. 152.

126. G. oblita, Lea.[‡]
Melania oblita, Lea, Philos. Trans., x. p. 298, t. 30, f. 6. Obs. v. p. 54. Binney, Check List, No. 182. Brot, List, p. 36.

127. G. acutocarinata,[§] Lea.
Melania acutocarinata, Lea, Philos. Proc., ii. p. 14, Feb., 1841. Philos. Trans., viii. p. 184, t. 6, f. 46. Obs. iii. p. 22. DeKay, Moll. N. Y., p. 99. Troost, Cat. Shells Tenn. Wheatley, Cat. Shells U. S., p. 24. Binney, Check List, No. 5. Catlow, Conch. Nomenc., p. 185. Brot, List, p. 36.
Elimia acutocarinata, Lea, Chenu, Manuel de Conchyl., i. f. 1979.

F. *Body whorl bi-multiangulated.*

128. G. tabulata, Anthony.
Melania tabulata, Anthony, Ann. N. Y. Lyc. Nat. Hist., vi. p. 118, t. 3, f. 18, March, 1854. Binney, Check List, No. 262. Brot, List, p. 39.

129. G. Catawbaea,[‖] Haldeman. (MSS.)

130. G. vittata, Anthony.
Melania vittata, Anthony, Ann. Lyc. Nat. Hist. N. Y., vi. p. 89, t. 2, f. 7, March, 1854. Binney, Check List, No. 294. Brot, List, p. 37. Reeve, Monog. Melania, sp. 262.

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[*] Described as from Alabama, but all the specimens before me are labelled "Kentucky" by Mr. Anthony, and I think the latter habitat is correct.

[†] I fear the Northern specimens of this species are not distinct from *depygis*, Say.

[‡] Differs from *symmetrica* in being striate.

[§] This shell is believed by Prof. Haldeman to = *simplex*, Say, but I doubt it. *Acutocarinata*, it is true, is not always carinate, but, it appears to me, is always narrowly lengthened.

[‖] A wider species than others of the group; none of the specimens are banded.

Melania pulcherrima,* Anthony, Proc. Acad. Nat. Sci., p. 58, Feb., 1860. Binney, Check List, No. 222. Brot, List, p. 37. Reeve, Monog. Melania, sp. 336.

131. G. subangulata,† Anthony.
Melania subangulata, Anthony, Ann. N. Y. Lyc. Nat. Hist., vi. p. 91, t. 2, f. 9, March, 1854. Binney, Check List, No. 252. Brot, List, p. 37. Reeve, Monog. Melania, sp. 242.
Melania paula, Lea, Proc. Acad. Nat. Sci., p. 122, 1861. Jour. Acad. Nat. Sci., v. pt. 3, p. 244, t. 35, f. 48, March, 1863. Obs. ix. p. 66.

132. G. symmetrica,‡ Haldeman.
Melania symmetrica, Haldeman, Monog. Lim., No. 4, p. 3 of Cover, October 5, 1841. Binney, Check List, No. 261. Jay, Cat., 4th ed., p. 275. Brot, List, p. 35. Reeve, Monog. Melania, sp. 328.
Melania imbricata, Anthony, Ann. N. Y. Lyc. Nat. Hist., vi. p. 105, t. 3, f. 5, March, 1854. Binney, Check List, No. 142. Brot, List, p. 36. Reeve, Monog. Melania, sp. 259.
Melania bicincta, Anthony, Proc. Acad. Nat. Sci., p. 56, Feb., 1860. Binney, Check List, No. 31. Brot, List, p. 36. Reeve, Monog. Melania, sp. 327.
Melania assimilis, Anthony, Proc. Acad. Nat. Sci., p. 60, Feb. 1860. Brot, List, p. 36. Reeve, Monog. Melania, sp. 464.
Melania assimilis, Lea, (mistake,) Binney, Check List, No. 22.
Goniobasis Uchéensis, Lea, Proc. Acad, Nat. Sci., p. 270, 1862. Jour. Acad. Nat. Sci., v. pt. 3, p. 334, t. 38, f. 194, March, 1863. Obs. ix. p. 156.
Goniobasis Barrattii, Lea, Proc. Acad. Nat. Sci., p. 271, 1862. Journ. Acad. Nat. Sci., v. pt. 3, p. 335, t. 38, f. 196, March, 1863. Obs. ix. p. 157.

133. G. iota, Anthony.
Melania iota, Anthony, Ann. N. Y. Lyc. Nat. Hist. vi. p. 86, t. 2, f. 4, March, 1854. Brot, List, p. 36. Binney, Check List, No. 153.

134. G. nigrocincta, Anthony.
Melania nigrocincta, Anthony, Ann. N. Y. Lyc. Nat. Hist. vi. p. 90, t. 2, f. 8, March, 1854. Brot, List, p. 36. Binney, Check List.

135. G. tecta, Anthony.
Melania tecta, Anthony, Ann. N. Y. Lyc. Nat. Hist. vi. p. 105, t. 3, f. 4, Mar. 1854. Binney, Check List, No. 265. Brot, List, p. 37. Reeve, Monog. Melania, sp. 253.
Goniobasis macella, Lea, Proc. Acad. Nat. Sci., p. 270, 1862. Jour. Acad. Nat. Sci. v. pt. 3, p. 333, t. 38, f. 192, March, 1863. Obs. ix. p. 155.

136. G. hybrida,§ Anthony.
Melania hybrida, Anthony, Proc. Acad. Nat. Sci. p. 60, Feb. 1860. Binney, Check List, No. 140. Brot, List, p. 36.
Melania subcarinata, Anthony, Reeve, Monog. Melania, sp. 282.

137. G. fuscocincta, Anthony.
Melania fuscocincta, Anthony, Ann. N. Y. Lyc. Nat. Hist. vi. p. 120, t. 3, f. 20, March, 1854. Binney, Check List, No. 118. Brot, List, p. 40. Reeve, Monog. Melania, sp. 415.

138. G. congesta,|| Conrad.

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* *G. pulcherrima* is the juvenile form.

† Differs from *vittata*, Anth., in having a more rounded aperture.

‡ The various synonyms of this species, inhabiting North and South Carolina, Alabama and Tennessee, are all characterized by an identical form, although varying somewhat in color. Having examined several hundred specimens, I find them to vary so much in that respect that I cannot unite any of the so-called species.

§ Differs from *symmetrica* in being more cylindrical, with the whorls more flattened.

|| I can obtain no information regarding this species except the meagre description. It has never been figured, and I cannot find specimens in our cabinets.

Melania congesta, Conrad, Amer. Jour. Sci., 1st ser. xxv. p. 343, Jan. 1834. DeKay, Moll. N. Y., p. 96. Wheatley, Cat. Shells U. S., p. 24. Binney, Check List, No. 64. Jay, Cat., 4th Edit., p. 273. Brot, List, p. 36.

G. *Short clavate, smooth species.*

139. G. auriculæformis, Lea.*
Melania auriculæformis, Lea, Philos. Proc., iv. p. 166. Philos. Trans., x. p. 62, t. 9, f. 39. Obs. iv. p. 62, t. 9, f. 39. Binney, Check List, No. 24. Brot, List, p. 32. Reeve, Monog. Melania, sp. 409.

140. G. Nickliniana, Lea.
Melania Nickliniana, Lea, Philos. Proc., ii. p. 12, Feb., 1841. Philos. Trans., viii. p. 171, t. 5, f. 18. Obs. iii. p. 9. DeKay, Moll. N. Y., p. 95. Reeve, Monog. Melania., sp. 375. Wheatley, Cat. Shells U. S., p. 26. Catlow, Conch. Nomenc., p. 187.
Leptoxis Nickliniana, Lea, Binney, Check List, No. 371.

141. G. aterina, Lea.†
Goniobasis aterina, Lea, Proc. Acad. Nat. Sci., p. 155, May, 1863.

142. G. Binneyana, Lea.
Goniobasis Binneyana, Lea, Proc. Acad. Nat. Sci., p. 266, 1862. Jour. Acad. Nat. Sci., v. pt. 3, p. 310, t. 37, f. 152, March, 1863. Obs. ix. p. 132.

143. G. ebenum, Lea.‡
Melania ebenum, Lea, Philos. Proc. ii. p. 12, Feb. 1841. Philos. Trans., viii. p. 166, t 5, f. 7. Obs. iii. p. 4. DeKay, Moll. New York, p 93. Jay, Cat., 4th Edit., p. 273. Binney, Check List, No. 93. Troost, Cat. Shells Tenn. Wheatley, Cat. Shells U. S., p. 25. Reeve, Monog. Melania, sp. 350. Catlow, Conch. Nomenc., p. 186. Brot, List, p. 31.
Anculotus ebenum, Lea, Reeve, Monog. Anculotus t. 4, f. 31.
Melania brunnea, Anthony, Ann. N. Y. Lyc. Nat. Hist. vi. p. 92, t. 2, f. 10, March, 1854. Binney, Check List, No. 41. Brot, List, p. 39. Reeve, Monog. Melania, sp. 319.
Melania Paula, Anthony, Brot, List, p. 40.

144. G. Vauxiana, Lea.
Goniobasis Vauxiana, Lea, Proc. Acad. Nat. Sci., p. 265, 1862. Jour. Acad. Nat. Sci., v. pt. 3, p. 309, t. 37, f. 150, March, 1863. Obs. ix. p. 131.

145. G. larvæformis, Lea.
Melania larvæformis, Lea, MSS., Reeve, Monog. Melania, sp. 357, Dec., 1860. Brot, List, p. 38.

146. G. auricoma, Lea.
Goniobasis auricoma, Lea, Proc. Acad. Nat. Sci., p. 265, 1862. Jour. Acad. Nat. Sci., v. pt. 3, p. 308, t. 37, f. 148, March, 1863. Obs. ix. p. 130.

147. G. glabra, Lea.§
Melania glabra, Lea, Proc. Acad. Nat. Sci., ii. p. 82, Oct., 1841. Philos. Trans., ix. p. 18. Obs. iv. p. 18. Wheatley, Cat. Shells U. S., p. 25. Binney, Check List, No. 123. Brot, List, p. 38. Reeve, Monog. Melania, sp. 439.

148. G. graminea, Haldeman, MSS.

149. G. gibbosa, Lea.
Melania gibbosa, Lea, Philos. Proc., ii. p. 34, April, 1841. Philos. Trans. x.

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* This shell reminds us of a young *olivula*, Con., but differs from that species in texture.

† Differs from *ebenum*, Lea, in being smaller, narrower, and more angulate at the periphery.

‡ Lighter-colored and more rounded than *iostoma*, Anthony. Mr. Lea considers that species to be identical with *ebenum*.

§ = *Simplex*, Say?

p. 301, t. 30, f. 12. Obs. v. p. 57, t. 30. f. 12. Binney, Check List, No. 121. Brot, List, p. 40.

150. G. Vanuxemii, Lea.
Goniobasis Vanuxemii, Lea, Proc. Acad. Nat. Sci., p. 265, 1862. Jour. Acad. Nat. Sci., v. p. 307, t. 37, f. 146. Obs. ix. p. 129.

151. G. cognata, Anthony.
Melania cognata, Anthony, Proc. Acad. Nat. Sci., p. 60, Feb., 1860. Binney, Check List, No. 59. Brot, List, p. 39. Reeve, Monog. Melania, sp. 458,

152. G. Georgiana, Lea.
Goniobasis Georgiana, Lea, Proc. Acad. Nat. Sci., p. 265, 1862. Jour. Acad. Nat. Sci., v. pt. 3, p. 308, t. 37, f. 149. Obs. ix. p. 130.

153. G. abrupta, Lea.
Melania àbrupta, Lea, Philos. Proc., iv. p. 165. Philos. Trans., x. p. 59, t. 9, f. 32. Obs. iv. p. 59, t. 9, f. 32. Binney, Check List, No. 2. Brot, List, p. 37. Reeve, Monog. Melania, sp. 397.

154. G. depygis, Say.
Melania depygis, Say, New Harmony Disseminator, p. 291. Say's Reprint, p. 19. Am. Conchology, Part 1, t. 8, f. 4, 5. Binney's Reprint, p. 145 and 157, t. 8. Binney, Check List, No. 87. Lapham, Cat. Moll. Wisconsin. Kirtland, Am. Jour. Sci. Kirtland, Rep. Zool. Ohio, p. 174. Shaffer, Catalogue. Higgins, Catalogue. Anthony, List, 1st and 2d Edit. Sager, Rept. Michigan Moll., p. 15. Wheatley, Cat. Shells U. S., p. 25. DeKay, Moll. N. Y., p. 89, t. 7, f. 135. Stimpson, Shells of New England, p. 32. Jay, Cat. Shells, 4th Edit., p. 273. Adams, Am. Jour. Sci., xl. p. 366. Adams, Thompson's Hist. Vermont, p. 152. Catlow, Conch. Nomenc., p. 186. Brot, List, p. 37. Deshayes, Lamark, Anim. sans. Vert., viii. p. 441. Reeve, Monog. Melania, sp. 373.
Melania occulta, Anthony, Proc. Acad. Nat. Sci., p. 5, Feb., 1860. Binney, Check List, No. 185. Brot, List, p. 38. Reeve, Monog. Melania, sp. 254.

155. G. livescens, Menke.
Melania livescens, Menke, Syn. Meth., p. 135, 1830. Binney, Check List, No. 163. Gould, Lake Superior, p. 245. Jay, Cat., 4th Edit., p. 274. Reeve, Monog. Melania, sp. 229. Brot, List, p. 38. Currier, Shells of Grand River Valley, Mich., 1859.
Melania Niagarensis,* Lea, Philos. Proc., ii. p. 12, Feb., 1841. Philos. Trans., viii. p. 173, t. 5, f. 21. Obs. iii. p. 11. DeKay, Moll. N. Y., p. 90. Wheatley, Cat. Shells U. S., p. 26. Binney, Check List, No. 175. Catlow, Conch. Nomenc., p. 187. Brot, List, p. 38. Currier, Shells of Grand River Valley, Mich. Bell, Canad. Naturalist, iv. pt. 3, p. 213, June, 1859.
Melania napella, Anthony, Bost. Proc., iii. p. 362, Dec., 1850. Binney, Check List, No. 170. Brot, List, p. 59.
Melania cuspidata, Anthony, Bost. Proc., iii. p. 362, Dec., 1850. Binney, Check List, No. 83. Reeve, Monog. Melania, sp. 283.
Melania correcta, Brot, List, p. 39.

156. G. Milesii, Lea.†
Goniobasis Milesii, Lea, Proc. Acad. Nat. Sci., p. 154, May, 1863.

157. G. simplex, Say.
Melania simplex, Say, Jour. Acad. Nat. Sci., v. p. 126, Sept., 1825. Binney's Edition, p. 115. Binney, Check List, No. 244. Dekay, Moll. N. Y., p.

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* In considering this species to be the same as *livescens*, I am sustained by the opinion of almost every American Conchologist.

† Larger, more convex, and of thinner texture than *livescens*.

100. Wheatley, Cat. Shells U. S., p. 27. Reeve, Monog. Melania, sp. 148. Jay, Cat., 4th Edit., p. 275. Brot, List, p. 38.

Melania Warderiana, Lea,[*] Philos. Proc., ii. p. 14, Feb., 1841. Philos. Trans., viii. p. 185, t. 6, f. 47. Obs. iii. p. 23. DeKay, Moll. N. Y., p. 99. Catlow, Conch. Nomenc., p. 189. Binney, Check List, No. 297. Brot, List, p. 39. Reeve, Monog. Melania, sp. 353.

Melania Wardiana, Lea, Wheatley, Cat. Shells U. S., p. 27.

Potadoma Warderiana, Lea, Chenu, Manual de Conchyl., i. f. 1972.

Melania densa, Anthony, Bost. Proc., iii. p. 360. Dec., 1850. Binney, Check List, No. 89. Brot, List, p. 31. Reeve, Monog. Melania, sp. 250.

158. G. Potosiensis, Lea.[†]

Melania Potosiensis, Lea, Philos. Proc., ii. p. 14, Feb., 1841. Philos. Trans., viii. p. 184, t. 6, f. 45. Obs. iii. p. 22. DeKay, Moll. N. Y., p. 99. Wheatley, Cat. Shells U. S., p. 26. Binney, Check List, No. 215. Catlow, Conch. Nomenc., p. 188. Brot, List, p. 36. Reeve, Monog. Melania, sp. 295.

159. G. torta, Lea.

Melania torta, Lea, Philos. Proc. iv. p. 165, Aug. 1845. Philos. Trans., x. p. 58, t. 9, f. 30. Obs. iv. p. 58. Binney, Check List, No. 272. Brot, List, p. 39. Reeve, Monog. Melania, sp. 377.

160. G. Saffordi, Lea.

Melania Saffordi, Lea, Philos., Trans. x. p. 300, t, 30, f. 10. Obs. v. p. 56. Binney, Check List, No. 236. Brot, List, p. 38. Reeve, Monog. Melania, sp. 365.

Melania virens, Anthony, Ann. N. Y. Lyc. Nat. Hist. vi. p. 93, t. 2, f. 11, Mar, 1854. Binney, Check List, No. 289. Brot, List, p. 40.

161. G. Newberryi, Lea.

Goniobasis Newberryi, Lea, Proc. Acad. Nat. Sci. March 20, 1860. Jour. Acad. Nat. Sci. v. pt. 3, p. 300, t. 37, f. 135, Mar. 1863. Obs. ix. p. 122. Binney, Check List, No. 174. Brot, List, p. 38.

162. G. bulbosa,[‡] Gould.

Melania bulbosa, Gould, Bost. Proc., ii. p. 225, July, 1847. Otia Conchologica, p. 46. Moll. Expl. Exped. p. 142, f. 163, 163a. 1852. Binney, Check List, No. 43. Brot, List, p. 58.

163. G. Lithasioides, Lea.

Goniobasis Lithasioides, Lea, Proc. Acad. Nat. Sci., May, 1863.

164. G. infantula, Lea.

Goniobasis infantula, Lea, Proc. Acad. Nat. Sci., May, 1863.

165. G. Louisvillensis, Lea.

Goniobasis Louisvillensis, Lea, Proc. Acad. Nat. Sci., May, 1863.

H. *Smooth, elevated species.*

166. G. pulchella,[§] Anthony.

Melania pulchella, Anthony, Bost. Proc. iii. p. 361, Dec. 1850. Higgins, Catalogue, p. 7. Reeve, Monog. Melania, sp. 257. Binney, Check List, No. 221. Brot, List, p. 38. Currier, Shells of Grand River Valley, Mich.

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[*] I am much indebted to Prof. Haldeman for the opportunity of studying the excellent suite of specimens collected by himself in Holston River, which conclusively proves the identity of these species.

[†] Were it not for the wide difference of habitat, I should suspect this to be the same as *simplex* of Say.

[‡] This species is exactly similar in outline to Mr. Lea's *Newberryi*, but none of the specimens of *bulbosa* that I have seen, (including Dr. Gould's types), exhibit the slightest indication of bands, while Mr. Lea declares his species to be always banded.

[§] Shell more elevated than *depygis*, which it resembles in color and ornamentation.

167. G. cinerea, Lea.

Goniobasis cinerea, Lea, Proc. Aad. Nat. Sci., p. 265, 1862. Jour. Acad. Nat. Sci. v. pt. 3, p. 306, t. 37, f. 145. Obs. ix. p. 128.

168. G. gracilior, Anthony.

Melania gracilis,[*] Anthony, Cover of No. 4. Haldeman's Monog. Limniades, Dec. 28, 1841. Shells of Cincinnati, 1st Edit. Newberry, Proc. American Association for Adv. of Science, v. p. 105. Jay, Cat. 4th Edit., p. 273.

Melania gracilior, Anthony, Ann. N. Y. Lyc. Nat. Hist. vi. p. 129, t. 1, f. 5, 1854. Higgins, Cat. p. 7. Binney, Check List, No. 127. Reeve, Monog. Melania, sp. 244.

Melania gracilis, Lea, Reeve, Monog. Melania, sp. 369.

169. G. Etowahensis,[†] Lea.

Goniobasis Etowahensis, Lea, Proc. Acad. Nat. Sci., p. 264, 1862. Jour. Acad. Nat. Sci., v. pt. 3, p. 299, t. 37, f. 133, Mar. 1863. Obs. ix. p. .

170. G. translucens, Anthony, (MSS.)

171. G. ovoidea,[‡] Lea.

Melania ovoidea, Lea, Philos. Proc. iv. p. 167, Aug. 1845. Philos. Trans., x. p. 61, t. 9, f. 38. Obs. iv. p. 61. Binney, Check List, No. 193. Brot, List, p. 38.

172. G. grata, Anthony.

Melania grata, Anthony, Proc. Acad. Nat. Sci., p. 61, Feb. 1860. Binney, Check List, No. 131. Brot, List, p. 34. Reeve, Monog. Melania, sp. 433.

Goniobasis Prairiensis,[§] Lea, Proc. Acad. Nat, Sci., p. 264, 1862. Jour. Acad. Nat. Sc., v. pt. 3, p, 299, t. 37, f. 132., Mar. 1863. Obs. ix. p. 121.

173. G. quadricincta, Lea, (MSS).

174. G. flava, Lea.

Goniobasis flava, Lea, Proc. Acad. Nat. Sci., p. 264, 1862. Jour. Acad. Nat. Sci., v. pt. 3, p. 303, t. 37, f. 139, Mar. 1863. Obs. ix. p. 125.

175. G. tenebrovittata, Lea.

Goniobasis tenebrovittata, Lea, Proc. Acad. Nat. Sci., p. 264, 1862. Jour. Acad. Nat. Sci., v. pt. 3, p. 301, t. 37, f. 136, Mar. 1863. Obs. ix. p. 123.

176. G. tenera, Anthony.

Melania tenera,[‖] Anthony, Reeve, Monog. Melania, sp. 407, Apr. 1861. Brot, List, p. 39.

Goniobasis Brumbyi, Lea, Proc. Acad. Nat. Sci., p. 263, 1862. Jour. Acad. Nat. Sci., v. pt. 3, p. 296, t. 37, f. 127, Mar. 1863. Obs. ix. p. 118.

G. spurca,[¶] Lea.

Melania spurca, Lea, Philos, Proc. iv. p. 166, Aug. 1845. Philos. Trans., x. p. 59, t. 9, f. 31. Obs. iv. p. 59. Binney, Check List, No. 248. Brot, List, p. 31.

178. G. Elliottii, Lea.

Goniobasis Elliottii, Lea, Proc. Acad. Nat. Sci., p. 271, 1862. Jour. Acad. Nat. Sci., v. pt. 3, p 338, t. 38, f. 201, Mar. 1863. Obs. ix. p. 160.

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[*] Preoccupied by Mr. Lea.

[†] Preoccupied for a nodose species, also from Georgia.

[‡] Mr. Reeve's figure 405, intended for this species, represents a species of *Lithasia*.

[§] Mr. Lea described this species under the misapprehension that the wider shell, which he now proposes to call *quadricincta*, was the species described as *grata* by Mr. Anthony, whereas, Mr. Anthony's types are of the narrow form.

[‖] *G. tenera* is the young shell.

[¶] Mr. Reeve's figure 340 does not represent this species.

179. G. **pallescens**, Lea.
Melania pallescens, Lea, Philos. Proc. iv. p. 166, Aug. 1845. Philos. Trans., x. p. 63, t. 9, f. 43. Obs. iv. p. 63. Binney, Check List, No. 196. Brot, List, p. 31.
Goniobasis inosculata,* Lea, Proc. Acad. Nat. Sci., p. 270, 1862. Jour. Acad. Nat. Sci., v. pt. 3, p. 334, t. 38, f. 195, Mar. 1863. Obs. ix. p. 156.

180. G. **parva**, Lea.
Goniobasis parva, Lea, Proc. Acad. Nat. Sci., p. 264, 1862. Jour. Acad. Nat. Sci., v. pt. 3, p. 297, t. 37, f. 129, Mar. 1863. Obs. ix. p. 119.

181. G. **Ocoëensis**,† Lea.
Melania Ocoëensis, Lea, Philos. Proc. ii. p. 12, Feb. 1841. Philos. Trans., viii., p. 169, t. 5, f. 13. Obs. iii. p. 7. DeKay, Moll. N. Y., p. 94. Troost, Cat. Shells Tennessee. Brot, List, p. 38. Wheatley, Cat. Shells U. S., p. 26. Catlow, Conch. Nomenc. p. 188.
Melania Ocoensis, Lea, Binney, Check List, No. 186.
Potadoma Ocoensis, Lea, Chenu. Man. de Conch. i. f. 1969.

182. G. **Anthonyi**, Lea.
Goniobasis Anthonyi, Lea, Proc. Acad. Nat. Sci., p 264, 1862. Jour. Acad. Nat. Sci., v. pt. 3, p. 303, t. 37, f. 140, Mar. 1863. Obs. ix. p. 125.

183. G. **Cahawbensis**, Lea.
Melania Cahawbensis, Lea, Proc. Acad. Nat. Sci., p. 121, 1861.
Goniobasis Cahawbensis, Lea, Jour. Acad. Nat. Sci., v. pt. 3, p. 223, Mar. 1863. Obs. ix. p. 45.

184. G. **Estabrookii**, Lea.
Goniobasis Estabrookii, Lea, Proc. Acad. Nat. Sci., p. 264, 1862. Jour. Acad. Nat. Sci. v. pt. 3, p. 298, t. 37, f. 131, Mar. 1863. Obs. ix. p. 120.

185. G. **Gabbiana**, Lea.
Goniobasis Gabbiana, Lea, Proc. Acad. Nat. Sci., p. 265, 1862. Jour. Acad. Nat. Sci., v. pt. 3, p. 304, t. 37, f. 141, Mar. 1863. Obs. ix. p. 126.

186. G. **subsolida**,‡ Lea.
Melania subsolida, Philos. Proc. ii. p. 12, Feb. 1841. Philos. Trans., viii. p. 168, t. 5, f. 12. Obs. iii. p. 6. Troost, Cat. Shells Tenn. Binney, Check List, No. 255. Wheatley, Cat. Shells U. S., p. 27. DeKay, Moll. N. Y., p. 94. Catlow, Conch. Nomenc. p. 188. Brot, List, p. 39.
Melania sordida, Lea, Philos. Proc. ii. p. 12, Feb. 1841. Philos. Trans., viii. p. 170 t. 5. f. 15. Obs., iii. p. 8. DeKay, Moll. N. Y., p. 94. Reeve, Monog. Melania, sp. 449. Jay, Cat. 4th Edit., p. 275. Troost, Cat. Shells Tennessee. Catlow, Conch. Nomenc. p. 188. Wheatley, Cat. Shells U. S., p. 27. Binney, Check List, No. 246. Brot, List, p. 33.
Potadoma sordida, Lea, Chenu, Manuel de Conchyl. i. f. 1971.
Melania perfusca, Lea, Philos. Proc. ii. p. 82, Oct. 1841. Philos. Trans., ix. p. 18. Obs. iv. p. 18. Wheatley, Cat. Shells U. S., p. 26. Jay, Cat. 4th Edit., p. 274. Binney, Check List, No. 201. Brot, List, p. 31. Reeve, Monog. Melania, sp. 354.
Melania incurta, Anthony, Reeve, Monog. Melania, sp. 300. Brot, List, p. 38.

187. G. **clavaeformis**, Lea.
Melania clavæformis, Lea, Philos. Proc. ii. p. 12, Feb. 1841. Philos. Trans. viii. p. 168, t. 5, f. 10. Obs., iii. p. 6. DeKay, Moll. N. Y., p. 93. Jay, Cat. 4th Edit., p. 273. Troost, Cat. Shells Tennessee. Wheatley, Cat. Shells U. S., p. 25. Reeve, Monog. Melaina, sp. 396. Binney, Check List, No. 57. Catlow, Conch. Nomenc, p. 186. Brot, List, p. 37.

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* I regard this as the half grown shell of *pallescens*.

† Mr. Reeve's figure 335 does not represent this species.

‡ An extensive suite of specimens before me, furnished through the kindness of Messrs. Gould and Haldeman, convinces me that the above descriptions all apply to one variable species.

188. G. castanea, Lea.
Melania castanea, Lea, Philos. Proc. ii. p. 11. Philos. Trans., viii., p. 164, t. 5, f. 2. Obs. iii. p. 2. DeKay, Moll. N. Y., p. 92. Troost, Cat. Shells Tennessee. Wheatley, Cat. Shells U. S., p. 24. Reeve, Monog. Melania, sp. 337.

189. G. Cumberlandiensis, Lea.
Goniobasis Cumberlandiensis, Lea, Proc. Acad. Nat. Sci., p. 155, May, 1863.

190. G. funebralis,[*] Anthony.
Melania funebralis, Anthony, Proc. Acad. Nat. Sci., p. 56, Feb. 1860. Binney, Check List, No. 114. Brot, List, p. 38. Reeve, Monog. Melania, sp. 372.

191. G. adusta, Anthony.
Melania adusta, Anthony, Proc. Acad. Nat. Sci., p. 55, Feb. 1860. Binney, Check List, No. 2. Brot, List, p. 37. Reeve, Monog. Melania, sp. 338.

192. G. furva, Lea.
Melania furva, Lea, Philos. Trans., x. p. 299, t. 30, f. 7. Obs., v. p. 55. Binney, Check List, No. 115. Brot, List, p. 38.

193. G. dubiosa, Lea.
Melania dubia,[†] Lea, Philos. Proc. ii. p. 11, Feb. 1841.
Melania dubiosa, Lea, Philos. Trans., viii. p. 166, t. 5, f. 6. Obs. iii. p. 4. DeKay, Moll. N. Y., p. 93. Binney, Check List, No. 91. Troost Cat. Shells Tennessee. Wheatley, Cat. Shells U. S., p. 25. Jay, Cat. 4th Edit., p. 273. Catlow, Conch. Nomenc. p. 186. Brot, List, p. 37.

194. G. laevigata,[‡] Lea.
Melania lævis, Lea, Philos. Proc. ii. p. 237, Dec. 1842. Philos. Trans., viii. p. 248. Obs. ii. p. 86.
Melania lævigata, Lea, Proc. Philos. Soc. ii. p. 237. Philos. Trans., vii. p. 165, t. 5, f. 3. Obs. iii. p. 3. Wheatley, Cat. Shells U. S., p. 26. Catlow, Conch. Nomenc. p. 187. Reeve, Monog. Melania, sp. 459.
Melania Leaii,[§] Brot, List, p. 34.

195. G. interlineata, Anthony, (MSS.)

196. G. Ohioensis, Lea.
Goniobasis Ohioensis, Lea, Proc. Acad. Nat. Sci., p. 265, 1852. Jour. Acad. Nat. Sci., v. pt. 3, p. 306, t. 37, f. 144. Obs. ix. p. 128.

197. G. brevispira, Anthony.
Melania brevispira, Anthony, Bost. Proc. iii. p. 361, Dec. 1850. Binney, Check List, No. 39. Jay, Cat. 4th Edit., p. 474. Brot, List, p. 37. Reeve, Monog. Melania, sp. 263.

198. S. semicarinata,[‖] Say.
Melania semicarinata, Say, New Harmony Disseminator, p. 261. Reprint, p. 16. American Conchology, Part 5, t. 47, f. 4. Binney's Reprint, p. 142, 200. Binney, Check List, No. 240. DeKay, Moll. N. Y., p. 100. Reeve, Monog. Melania, sp. 368. Wheatley, Cat. Shells U. S. p. 27. Jay, Cat. Shells 4th Edit., p. 275. Catlow, Conch. Nomenc, p. 188. Brot, List, p. 38. Kennicott, Trans. Ills. State Agricul. Soc. p. 595.

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[*] Narrower and more lengthened than the nearly allied *G. adusta*. It has not the pale yellowish sutural band of that species.

[†] Preoccupied.

[‡] I doubt whether this is more than an immature stage of *dubiosa*.

[§] Proposed by Mr. Brot, because *lævigata* is preoccupied in *Melania*; but that name must stand, as it is *not* preoccupied in *Goniobasis*.

[‖] The shells included in the above extensive synonymy present some variation in form and coloration, but in an examination of several thousand specimens I was unable to separate the so-called species satisfactorily. *G. semicarinata*, Say, is the young shell, which, when old, varies in form, being narrow in *angustispira* and *exilis*, and broader in the other synonyms. The species inhabits an extensive range of country.

Melania angustispira, Anthony, Proc. Acad. Nat. Sci., p. 55, Feb. 1860. Binney, Check List, No. 16. Brot, List, p. 37.

Melania angusta, Anthony, Reeve, Monog. Melania, sp. 359.

Melania exilis, Haldeman, suppl. to No. 1 Monog, Limniades, Oct. 1840.

Melania rufula, Haldeman, Monog. Limniades, No. 2, p. 3 of Cover, January, 1841. Binney, Check List, No. 234. Brot, List, p. 39.

Melania Kirtlandiana, Lea, Philos. Proc. ii. p. 11, Feb. 1841. Philos. Trans., viii., p. 165, t. 5, f. 4. Obs. iii. p. 3. Anthony, Cat. 1st Edit. Higgins, Cat. DeKay, Moll. N. Y., p. 92. Wheatley, Cat. Shells U. S., p. 25. Reeve, Monog. Melania, sp. 361. Binney, Check List, No. 155. Brot, List, p. 36. Catlow, Conch. Nomenc, p. 187.

Melania Kirtlandia, Lea, Philippi, Beschreib, Neuer Conchyl. Melania, t. 3. f. 8.

Melania elata, Anthony, Bost. Proc. iii. p. 362, Dec. 1850. Binney, Check List, No. 95. Brot, List, p. 37. Reeve, Monog. Melania, sp. 331.

Melania bicolorata, Anthony, Bost. Proc. iii. p. 361, Dec. 1850. Binney, Check List, No. 32. Brot, List, p. 58.

Melania bicolor, Anthony, Reeve, Monog. Melania, sp. 265

Melania inornata, Anthony, Bost. Proc. iii. p. 360. Dec. 1850.

Melania succinulata, Anthony, Bost. Proc. iii. p. 363, Dec. 1850. Binney, Check List, No. 258. Brot, List, p. 59.

Melania varicosa, Ward, Haldeman, Monog. Limniades, Part iii. p. 3 of Cover, Mar. 13, 1854. Anthony, List, 1st and 2d Editions. Jay, Cat. 4th Edit., p. 275. Binney, Check List, No. 284. Catlow, Conch. Nomenc. p. 189.

Melania livida, Reeve, Monog. Melania, sp. 434. Brot, List, p. 30. .

Goniobasis Grosvenorii, Lea, Proc. Acad. Nat. Sci., p. 263, 1862. Jour. Acad. Nat. Sci. v. pt. 3, p. 297, t. 37, f. 128, Mar. 1863. Obs. ix. p. 119.

Melania babylonica,* Lea, Philos. Proc. ii. p. 14, Feb. 1841. Philos. Trans., viii. p. 183, t. 6, f. 43. Obs. iii. p. 21. DeKay, Moll, N. Y., p. 98. Wheatley, Cat. Shells U. S. p. 24. Binney, Check List, No. 26. Catlow, Conch. Nomenc. p. 185. Brot, List, p. 36.

199. G. Haldemani, Tryon, (MSS.)

Melania acuta, Lea, Bell, Canadian Nat. iv. pt. 3, p. 213. Lewis, Bost. Proc. vi. p 2.

Melania exilis, Haldeman, Adams, Moll. Vermont.

200. G. curvilabris, Anthony.

Melania curvilabris, Anthony, Ann. N. Y. Lyc. Nat. Hist. vi. p. 102, t. 3, f. 1, Mar. 1854. Binney, Check List, No. 82. Brot, List, p. 31. Reeve, Monog. Melania, sp. 378.

201. G. informis, Lea.

Goniobasis informis, Lea, Proc. Acad. Nat. Sci., p. 154, May, 1863.

202. G. vittatella, Lea.

Goniobasis vittatella, Lea, Proc. Acad. Nat. Sci., p. 155, May, 1863.

203. G. Alexandrensis, Lea.

Melania Alexandrensis, Lea, Philos. Proc. iv. p. 167. Philos. Trans., x. p. 61, t. 9, f. 37. Obs. iv. p. 61. Binney, Check List, No. 8. Brot, List, p. 37.

204. G. Haleiana, Lea.

Melania Haleiana, Lea, Philos. Proc. iv. p. 167, Aug. 1845. Philos. Trans., x. p. 60. t. 9, f. 35. Obs. iv. p. 60. Binney, Check List, No. 134. Reeve, Monog. Melania, sp. 406.

205. G. rubella, Lea.

Goniobasis rubella, Lea, Proc. Acad. Nat. Sci., p. 270, 1862. Jour. Acad. Nat. Sci., v. pt. 3, p. 332, t. 38, f. 191, Mar. 1863. Obs. ix. p. 154.

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* A scalariform monstrosity.

206. G. spinella, Lea.
Goniobasis spinella, Lea, Proc. Acad. Nat. Sci., p. 264, 1862. Jour. Acad. Nat. Sc., v. pt. 3, p. 298, t. 37, f. 130, Mar. 1863. Obs. ix. p. 120.

207. G. Draytonii, Lea.
Goniobasis Draytonii, Lea, Proc. Acad. Nat. Sci., p. 264, 1862. Jour. Acad. Nat. Sci., v. pt. 3, p. 300, t. 37, f. 134, March, 1863. Obs. ix. p. 122.
Goniobasis nigrina, Lea, Proc. Acad. Nat. Sc., p. 263, 1862. Jour. Acad. Nat. Sci. v. pt. 3, p. 299, t. 37, f. 133. Obs. ix. p. 121.

208. G. proxima, Say.
Melania proxima, Say, Jour. Acad. Nat. Sci., p. 126, Sept. 1825. Reeve, Monog. Melania, sp. 275. Binney's Edit. of Say, p. 115. Binney, Check List, No. 220. DeKay, Moll. N. Y., p. 99. Wheatley, Cat. Shells U. S., p. 26. Gibbes' Report, p. 19. Jay, Cat. 4th Edit., p. 274. Brot, List, p. 38.
Melania carinata,* Ravenel, Cat. p. 11, 1834. Wheatley, Cat. Shells U. S., p. 24. Binney, Check List, No. 47.
Melania Taitiana, Lea, Philos. Proc., ii. p. 11, Feb., 1841. Philos. Trans. viii. p. 165, t. 5, f. 5. Obs. iii. p. 3. DeKay, Moll. N. Y., p. 92. Wheatley, Cat. Shells U. S., p. 27. Jay, Cat., 4th edit., p. 275. Binney, Check List, No. 264. Catlow, Conch. Nomenc., p. 189. Reeve, Monog. Melania, sp. 444. Brot, List, p. 37.
Melania rufa, Lea, Philos. Proc., ii. p. 12, Feb., 1841. Philos. Trans., viii. p. 167, t. 5, f. 8. Obs. iii. p. 5. Troost, Cat. Shells Tennessee. Wheatley, Cat.. Shells U. S., p. 26. Catlow, Conch. Nomenc., p. 188.
Melania rufescens, Lea, DeKay, Moll. N. Y., p. 93. Jay, Cat., 4th edit., p. 274. Binney, Check List, No. 233. Brot, List, p. 37.
Melania approximata, Haldeman, Monog. Limniades, No. 4, p. 4 of Cover, Dec. 28, 1841. Jay, Cat., 4th edit., p. 272. Binney, Check List, No. 18. Brot, List, p. 36.
Melania abjecta,† Haldeman, Reeve, Monog. Melania, sp. 341. Brot, List, p. 34.
Goniobasis rubricata, Lea, Proc. Acad. Nat. Sci., p. 271, 1862. Jour. Acad. Nat. Sci. v. pt. 3, p. 335, t. 38, f. 197. Obs. ix. p. 157, t. 38, f. 197.

I. *Striate species, spire elevated.*

209. G. Virginica, Gmelin.
Buccinum Virginica, Gmelin, Syst. Nat. . Green, Trans., Alb. Inst., i. p. 135. Wood, Index Test., t. 24, f. 154.
Paludina Virginica, Say, Nicholson's Encyc., iii. t. 2, f. 4.
Melania Virginica, Say, Am. Conch., pt. 5, t. 47, f. 2. App. to Long's Exped., ii. p. 265. Binney's Edit., p. 131 and 199. Binney, Check List, No. 291. Catlow, Conch. Nomenc., p. 189. Philippi, Neüer Conchylien Melania, t. 2, f. 12. Hildreth, Am. Jour. Science, xxxi. p. 53. Sager, Rept. Zool. Mich., p. 15. Conrad, Am. Jour. Science, N. S., i. p. 407. Haldeman, Rupps Hist. Lancaster County, Pa., p. 479. Haldeman, Am. Jour. Sci., xli. p. 22. DeKay, Moll. N. Y., p. 90, t. 7, f. 141. Wheatley, Cat. Shells U. S., p. 27. Hartman, Catalogue Shells Chester Co., Pa. Brot, List, p, 35. Girard, Proc. National Inst., i. No. 2, p. 82. Jay, Cat,, 4th edit., p. 275. Reeve, Monog. Melania, sp. 321.
Limnæa Virginica, Say, Short and Eaton, Notices, p. 82.
Juga Virginica, Say, Chenu, Man. de Conchyl. i. f. 2019.
Melania multilineata, Say, Jour. Acad. Nat Sci., ii. p. 380, Dec. 1822. Am.

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* I make this a synonym on the authority of Dr. Jay.

† I doubt whether this shell really came from Arkansas, although the *established* geographical distribution of *proxima* is very great.

Conchology, pt. 5, t. 47, f. 2. Binney's Edit., p. 111 and 199. Binney, Check List, No. 169. DeKay, Moll. Rept. to Regents, p. 32. Moll. N. York, p. 97. Wheatley, Cat. Shells U. S., p. 26. Hartman, Cat. Shells Chester Co., Penna. Catlow, Conch. Nomenc., p. 187. Girard, Proc. Nat. Inst., i. No. 2, p. 82, March, 1856. Philippi, Neuer Conchyl. Melania, t. 2, f. 13.

Melania auriscalpium,[*] Menke.

Melania curta, Menke, Syn. Meth., p. 135, 1830.

Melania fasciata, Menke, Syn. Meth., p. 136, 1830.

Melania bizonalis, DeKay, Moll. N. Y., p. 91, t. 7, f. 140, a. b. 1843. Binney, Check List, No. 35.

Melania Buddii, DeKay, Wheatley, Cat. Shells U. S., p. 24.

Melania gemma,[†] DeKay, Moll. N. Y., p. 91, t. 7, f. 142, 1843. Binney, Check List, No. 119. Brot, List, p. 38.

Melania striggilata, Muhlfeldt,[‡] in Litt.

Melania inemta, Anthony, Bost. Proc., iii., p. 362, Dec., 1850. Binney, Check List, No. 145. Brot, List, p. 58.

210. G. sulcosa, Lea.[§]

Melania sulcosa, Lea, Philos. Proc. ii. p. 14, Feb., 1841. Philos. Trans., viii. p. 185, t. 6, f. 48. DeKay, Moll. N. Y., p. 99. Troost, Cat. Shells Tenn. Catlow, Conch. Nomenc., p. 189. Binney, Check List, No. 259. Wheatley, Cat. Shells U. S., p. 27. Brot, List, p. 35.

Ceriphasia sulcosa, Lea, Chenu, Man. de Conchyl. i. f. 1957.

211. G. Buddii, Lea.

Melania Buddii, Lea, Philos. Proc. iv. p. 165. Philos. Trans. x. p. 64, t. 9, f. 44. Obs. iv. p. 64. Binney, Check List, No. 42. Jay, Cat., 4th Edit., p. 273. Reeve, Monog. Melania, sp. 324.

212. G. Troostiana, Lea.

Melania Troostiana, Lea, Philos. Proc., ii. p. 34, April, 1841. Philos. Trans., p. 92, t. 23, f. 86. Obs. ii. p. 92. DeKay, Moll. N. York, p. 100. Wheatley, Cat. Shells U. S., p. 27. Binney, Check List, No. 276. Troost, Cat. Shells Tenn. Jay, Cat., 4th Edit., p. 275. Catlow, Conch. Nomenc., p. 189. Brot, List, p. 35. Reeve, Monog. Melania, sp. 339.

213. G. latitans, Anthony.

Melania latitans, Anthony, Ann. Lyc. Nat. Hist. New York, vi. p. 88, t. 2, f. 6, March, 1854. Binney, Check List, No. 159. Brot, List, p. 34.

214. G. porrecta, Lea.

Goniobasis porrecta, Lea, Proc. Acad. Nat. Sci., p. 155, May, 1863.

215. G. sculptilis, Lea.

Melania sculptilis, Lea, Philos. Trans., x. p. 297, t. 30, f. 3. Obs. v. p. 53, t. 30, f. 3. Binney, Check List, No. 238. Brot, List, p. 38.

216. G. crenatella, Lea.

Melania crenatella, Lea, Proc. Acad. Nat. Sci., v. pt. 3, p. 268, t. 35, f. 79, March, 1863. Obs. ix. p. . Binney, Check List, No. 76. Brot, List, p. 34. Reeve, Monog. Melania, sp. 457.

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[*] Prof. Haldeman was the first naturalist who identified the various descriptions of Menke with *Virginica*. Philippi has since figured some of these as varieties of that species.

[†] This shell has been referred both to *Virginica* and to *depygis* by American Authors. I do not give a confident opinion as to its proper place. About *bisonalis* of DeKay there can be no doubt.

[‡] Teste Philippi, Neuer Conchyl.

[§] When perfect specimens of this shell are obtained, it may prove to be a *Pleurocera* instead of a *Goniobasis*.

March 1*st.*

Vice-President VAUX in the Chair.

Eleven members present.

The following were presented for publication :—

"Synonymy of the Strepomatidæ of North America." By Geo. W. Tryon, Jr.

"Thoughts on the Influence of Ether upon the Solar System." By A. Wilcocks, M. D. Part III.

March 8*th.*

Vice-President BRIDGES in the Chair.

Thirty members present.

The following was presented for publication :

"Additions to the Catalogue of Stars which have changed their colors." By Jacob Ennis.

March 15*th.*

Vice-President VAUX in the Chair.

Twenty members present.

The following were presented for publication :

"Note on the Nomenclature of Genera and Species of Echeneidoidæ," and "Description of a new labroid Genus allied to Trochocopus." By Theo. Gill.

"New Species of Mordellestina collected in Illinois." By C. A. Helmuth, M. D.

Notes on the Birds of Jamaica." By W. T. March, with remarks by S. F. Baird. Part III.

Dr. Leconte remarked, that his attention had been called to the following passage in the Report on the progress of Entomology, by Dr. Gerstaecker, in the last number of Tröschel's Archiv für Naturgeschichte, in which he refers to the Classification of the Coleoptera of North America, Part 1, by Dr. Leconte.

"Die Stylopiden setzt der Verf. unter die Heteromeren, bemerkt aber das die Tarsen nicht heteromer seien, was richtig ist. Früher habe man sie als eigne Ordnung betrachtet, aber die Kenntniss ihrer Verwandlungen, und eine genauere, [more rigid!] Interpretation ihrer äuseren Baues habe fast alle [nearly all!] Systematiker dazu bestimmt, sie unter die Käfer zu bringen. (Welche Charactere hat ein Strepsipteron mit einem Käfer gemein?—Keinen! Wo sind die Ubereinstimmungen der Larven und ihrer Lebensweise? Die Strepsipteren Larven leben parasitisch in Hinterleibe von Hymenopteren, die Meloïden Larven nähren sich von Honig; beide haben also in der Lebensweise nichts untereinander gemein.")

"In Elementarbüchern sollte man Absurditäten am Wenigsten für baare Münze ausgeben!"

I do not propose here to enter into a discussion of the views which have induced Lacordaire, Burmeister, Newman and Schaum to consider Stylopidæ as a family of Coleoptera, an opinion which many others have silently acquiesced in. The subject was considered nearly exhausted, until reopened by Duval, in his note on the order Rhipiptera, (Gen. Col. Europe, 3,419), published subsequently to my work on Classification.

I will, however, answer briefly the questions asked by Dr. Gerstaecker in the passage above cited.

The characters common to a Strepsipteron and various Coleoptera are these: 1. Hypermetamorphosis of the larva, (Meloidæ); 2. Parasitism, (Rhipidius); 3. Retention of the Pupa within the skin of the larva, (Lampyridæ, tribe Lycini, genus Calopteron); 4. Unfitness of anterior wings for flight, (a character also found in Orthoptera and Hemiptera, which, however, have no metamorphosis); 5. Large development of metathoracic segment.

Even if the Stylopidæ are considered as a distinct order—Strepsiptera—it will be necessary to place them immediately after the Coleoptera.

In view of the great variation of characters found in Coleoptera, it would seem rational to consider Stylopidæ as an extreme and degraded form of that order, rather than to regard such a small number of objects, closely related in form, structure and habits, as an equivalent to the great orders Coleoptera, Orthoptera and Hemiptera, with which alone they can be morphologically compared, (characters 4 and 5).

The information given by Dr. Gerstaecker regarding the difference in food and manner of life between the larvæ of Meloidæ and Stylopidæ, though not original, is doubtless quite interesting, but seems to imply that I had compared them together, which is not correct.

Mr. Cassin called the attention of the Academy to the collection of birds presented this evening by the Smithsonian Institution, and particularly referred to several species of great rarity and scientific value. The *Didunculus strigirostris* is one of two species of birds now known to be approaching extinction, the other species being *Alca impennis*, which is also in the Academy Museum. This bird is the most nearly allied to the extinct Dodo, formerly of the Isle of France, and inhabits the Samoan or Navigator Islands. Its extinction or approach to it is said to be owing to the introduction into those islands of the domestic cat. Not more than four or five specimens are known to be extant.

Other little known types were pointed out and exhibited to the Academy, such as *Carpophaga Auroræ*, *Carpophaga latrans*, *Artamus mentalis* and others. This interesting series is from the collection of the United States Exploring Expedition of the Vincennes and Peacock, and is presented to the Academy by the Smithsonian Institution.

March 22*d.*

Vice-President Bridges in the Chair.

Seventeen members present.

The following were presented for publication:

"Critical Remarks on the Genera Sebastes and Sebastodes," and "Second Contribution to the Selacology of California." By Theo. Gill.

"A Critical review of the Family Procellaridæ; Part I." By E. Coues, M. D.

"Thoughts on the Influence of Ether on the Solar System; Part IV." By Alex. Wilcocks, M. D.

March 29*th.*

Vice-President Bridges in the Chair.

Seventeen members present.

On report of the respective committees, the following were ordered to be published:—

Additions to the Catalogue of STARS which have Changed their Colors; or which have appeared with different Colors at different times.[*]

BY JACOB ENNIS.

Sirius.—On the re-appearance of this star during the months of November and December, 1863, I very carefully watched its color. Its decided change of appearance since the early part of the year greatly interested me. Instead of a full bright green, it was of a pale yellowish green. During those two months the atmosphere passed through the extremes of variability, but the pale yellowish green of Sirius remained constant. On the 29th of December I asked Dr. Wilcocks, the discoverer of its being purple three years ago, how Sirius appeared to him now? Without knowing my opinion, and without any hesitation, he answered, "It is not as green as it was when visible last winter." This coincidence of his views with my own confirms the idea that he was not mistaken three years ago, as he since supposed, when he regarded the color of Sirius to be violet. According to these evidences this great star has had five distinct colors: red during the ancient times; white in 1850, and subsequently; violet in 1861; full green in the autum and winter of 1862—3; pale yellowish green in November and December of 1863.

Note of April 19th, 1864. The above observations were written early in January. For the last three or four weeks the green color of Sirius has again been tinged with blue; but this evening no blue is visible, and the yellow mingled with the green is conspicuous. In this I am confirmed by a member of the Academy whose powers of observation are remarkably good. The clearness of the atmosphere is perfect, but the moon is large and bright, and I have a suspicion that the yellow of Sirius, though in a different quarter of the heavens, may be due to the moon's reflected rays. The following portions of this paper, except that on No. 21, were written previous to the 10th of November, 1863, at which date they were presented.

Altair and Deneb, or Alpha Cygni.—The former of these stars was described by Humboldt in 1850 as yellow and the latter as white. They were numbered 18 and 19 in this Catalogue, and announced to be blue in June, 1863. I had watched them for several months nearly every clear night, and, on the 20th of August, I first noticed that they were green. On all good nights since then they have appeared to myself and to others, whose opinions I have solicited, to be conspicuously green; but on damp, slightly hazy nights, from the effects of the atmosphere, they appear blue. It is rather oppressive for me to make this announcement, for I have been obliged already, in a former communication, to say that two other large stars, Sirius and Vega, had changed from blue to green. Certainly this change does not arise from any peculiarities of vision, for I have in all cases carefully consulted the views of others and found them to accord with my own. I know not how to attribute the change to atmospheric causes, for I had observed them all, except Sirius, to be blue several months before, in all weathers.

Vega.—For the last four or five weeks, this star has not appeared to me as green as during last summer. Its rather bluish appearance may, perhaps, be attributed to greater haziness of the atmosphere.

Castor.—See No. 10 of this Catalogue. In addition to the colors already given, the two companions of this double star have been described as follows: Yellow and yellowish by Sestini; greenish yellow and green by Dembowski;

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[*] See these Proceedings for 1863, pp. 26, 96, 159.

bright and pale white by Webb; yellow and warm yellow by Miss Maria Mitchell.

20. Arcturus.—This is one of the stars denominated red by the ancients. In modern times, according to reliable observations, it has changed its color. J. F. Julius Schmidt, formerly of Ulmutz, recently made Director of the Astronomical Observatory at Athens, and distinguished for his observations on variable stars, which he communicated to the Ast. Nach., says, that for eleven years he had considered Arcturus to be one of the reddest of the stars, and, especially in 1841, he had ranked it in color with Mars. To his surprise in 1852 he saw it to be yellow, and entirely destitute of any reddish hue. It then appeared to him by the naked eye lighter than Capella. Capella two years before had been described by Humboldt as yellow, with scarcely a tinge of red; since then Capella has become blue. During the present year, 1863, I have dozens of times and in all weathers observed Arcturus to be decidedly orange, and of a clear, beautiful color. In this I have been confirmed by other observers. The colors of Arcturus may therefore be stated as having been red, yellow and orange.

References have already been made in this Catalogue to the changes of color in double and multiple stars. The numbers, such as 3 : 7½, immediately after the names of the following double stars, indicate the magnitudes of the companions. The authorities are given after the colors. Some of these I have taken from the original papers, and some I have not so verified, but presume them all to be correct.

21. 95 Herculis, 5 : 5.—Hitherto catalogued as a diversely colored pair of stars to an extreme degree: one being described as apple green and the other as cherry red, and also as an astonishing yellow green and an egregious red. In 1856—58 they were nearly colorless and without any diversity of tint, and in this latter manner they were described by Struve in 1832—3, and by Sestini in 1844—5. Hence a probability of their being colorless once in about twelve years."—C. Piazzi Smyth.*

In the November number, 1863, of the Monthly Notices of the Royal Astronomical Society, a suggestion is made, from very high authority, that because the changes in the two companions have in all these cases been simultaneous, they are liable to the suspicion of having been produced by instrumental causes. But this apparent simultaneousness of change may have been produced by a real change in only one of them. If the two stars were white and one of them were to change to an "egregious red," then by contrast in close proximity, from the well known principle of complementary colors, the other would necessarily appear green. The operation of this principle has been very conspicuous in this city during political demonstrations and celebrations, when bright red lights have been kept burning in the streets. The ordinary gaslights all around them have appeared strongly green. It is submitted that this cause for the simultaneous change in both stars is more probable by far than that three different instruments, in the hands of three different men, in three different countries and at as many different periods, should all, from some unknown cause, fall into the same error; and this not when directed at the stars generally, but only when pointed to a particular one.

22. Mizar, Zeta Ursæ Majoris, 3 : 4.—Both greenish white. Struve.
White and pale green. Webb.
Both yellow, the 4 has the deeper hue. Mitchell, 1860, April 30.†

23. Xi Bootis, 3½ : 6½.—Orange and purple. Webb.‡
Pale yellow and Orange. Mitchell, 1862, July 6.

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* See the Proceedings of the British Scientific Association for 1863.

† See American Journal of Science and Art. July, 1863, for Miss Mitchell's observations.

‡ For several valuable popular papers on the double stars, by the Rev. Mr. Webb, see the first four volumes of the *Intellectual Observer*, London.

24. 32 Eridani, 5 : 7.—Bright yellow and flushed blue. Webb.
Orange yellow and pale blue. Mitchell, 1861, Jan. 31.
Yellow and pale green, very decided. Mitchell, 1862, Dec. 28.
Yellow and green. Mitchell, 1863, Jan. 1.

25. Gamma Virginis, 4 : 4.—Silvery white and pale yellow. Webb.
Both yellow. Mitchell, 1860, Feb. 20.

26. 35 Piscium, 6 : 8.—White and purplish. Webb.
The 6 is light yellow. The 8 is peculiar; there is a brown mingling with its reddish light. Mitchell, 1860, Jan. 2.

27. 23 Orionis, 5 : 7.—Greenish white and white. Struve.
Creamy white and blue. Webb.
The 7 is of a darkish color. Mitchell, 1860, Mar. 6.

28. 39 Ophiuchi, 5½ : 7½.—Pale orange and blue. 1838.
The 7½ yellow. Sestini, 1846.
" bluish. Smyth, 1851.
" clear blue. Webb, 1854.

29. Polaris, Alpha Ursæ Minoris, 2½ : 9½.—Yellow and dull white. Struve.
Yellow and blue. Sestini, Dawes, Webb.

30. Iota Cancri, 5½ : 8.—The 8 deep garnet, Feb. 8, 1782; bluish Dec. 28, 1782; and blue, Mar. 12, 1785. Herschel, Sr.
Pale orange and clear blue. Webb.

31. Sigma Scorpii, 4 : 9½.—The 9½ white. Sestini.
Dusky and plum color. Webb.

32. Delta Corvi, 3 : 8½.—The 8½ white. Sestini.
Pale yellow and purple. Webb.

33. Pi Bootis, 3½ : 6.—Both white; a ruddy tinge sometimes in 6. Webb.

34. Alpha Herculis, 3½ : 5½.—"Intense cærulea." Struve.
Orange and emerald. Webb.

35. Delta Serpentis, 3 : 5.—Yellow tints. Dembowski.
Bright white and bluish white. Webb.
Both Bluish. Webb.

36. Eta Cassiopeæ, 4 : 7½.—"Flava et purpurea." Struve, Fletcher.
Red and green. Herschel, Jr., South.
Yellow and orange. Sestini.
Dull white and lilac. Webb.

37. Iota Bootis, 4½ : 8.—The 8 azure. Sestini.
The 8 lilac. Webb, 1850.
Light yellow and dusky white. Webb, 1850.

38. 39 Bootis, 5½ : 6½.—White and lilac. Some writers ascribe a bluish and some a ruddy tint to 6½. Webb.

39. Epsilon Lyræ.—The two companions of this double star are designated.
Epsilon 1 and Epsilon 2. Each of these again are double.
Epsilon 1, 5 : 6½. Yellow and ruddy. Webb.
During five years the 5 was bluish. Struve, Dembowski.

40. Gamma Cygni, 4 : 7.—Both white. Herschel, Sr.
Viridi-cærulea. Struve.
The 7 light emerald. Smyth, 1839.
Golden yellow and flushed grey. Webb, 1850.

41. Beta Lyræ.—A quadruple star; 3 : 8 : 8½ : 9.

42. Gamma Lyræ, of 3d magnitude.—Both these stars, Beta Lyræ and Gam-Lyræ, seem to be changing their colors. Herschel, Sr., and South gave Beta as white. Next, Smyth, in 1834, gave the general impression as white, the four companions being in the following order: very white and splendid, pale grey, faint yellow, light blue. He gave Gamma Lyræ then as being bright yellow. Schmidt regarded the colors of both Beta and Gamma the same—yellowish white—from 1844 to 1855. Webb, in 1849—50, regarded Gamma as much less yellow than Beta, if not white. In 1862, the latter observer found Gamma the paler in tint, though the difference was not considerable. According to these statements Beta changed from white to yellow and Gamma from yellow to white. Both were of the same color,—yellowish white,—according to Schmidt, about 1844. The only discrepancy is Schmidt, for the latter portion of his time, the former portion being remarkably confirmative.

43. Eta Lyræ, 5 : 9.—Cærulea. Struve, during five years, about 1830.
Sky blue and violet. Webb, 1834.
The 5, yellow. " 1849—50.
" pale yellow. " 1862.

44. Gamma Andromedæ, 3½ : 5½.—Deep yellow and sea green. Webb, 1862. The 5½ is double, and the colors of the two latter have been given as follows:
Subviridis et violacea. Secchi, 1856.
Yellow and blue. Sir W. K. Murray, 1857.
" " Dawes, Jacob.

45. Gamma Arietis, 4½ : 5.—Both "egregie albæ." Struve, 1830.
White. Dembowski, 1852, 1854, 1856.
The same, either white or light yellow. Piazzi Smyth, 1856.
Full white and faint blue. Webb, 1862.

46. Iota Trianguli, 5½ : 7.—White or yellow and blue. Secchi.
Topaz yellow and green. Webb, 1862.

47. Gamma Ceti, 3 : 7.—The 7 tawny. Webb, 1850.
Pale yellow and lucid blue. Webb, 1863.

48. Gamma Leonis, 2 : 4.—White and reddish white. Herschel, Sr.
Bright orange and greenish yellow. Webb.

49. 72 P. II. Cassiopeæ, 4½ : 7 : 9.—White, blue, ruddy violet. Dembowski. 1854—6.
Pale yellow, lilac, blue. Webb, 1863.

50. Kappa Cephei, 4½ : 8½.—The 4½ greenish. Struve.
Pale yellow and blue. Webb, 1863.

51. Zeta Cephei, 5 : 7.—Yellowish and blue. Struve, 1831.
Both bluish. Smyth, 1839.

White and tawny or ruddy. Webb, 1850.
Flushed white and pale lilac. " 1851.

52. 40 Draconis, 5½ : 6.—Both white. Struve, 1832.
Both white. Webb, 1839.
Both white or yellowish. Webb, 1850.
Both yellow, the 5½ deeper. " 1856 and 1863.

53. 12 Canum Venaticorum, 2½ : 6½.—White and red. Herschel, Sr.
"With all attention I could perceive no contrast of colors in the two stars." Herschel, Jr., 1830.

Both white. Struve, 1830.
Yellow and blue. Sestini, 1844.
Full white and very pale white. Smyth, 1850.
White or a little yellowish, and tawny or lilac. Webb, 1850.
Pale reddish white and lilac. Smyth, 1855.
White and pale olive blue. Dembowski, 1356.
Same as in 1850, but with very little contrast. Webb, 1862.
Flushed white and pale lilac. Webb, 1862.

54. Sigma Coronæ, 6 : 6½.—Creamy white and smalt blue. Webb, 1862.
The 6½ has had many changes, as follows ; certainly not blue and differing very little from the other. South, 1825.
White. Struve, 1836.
A yellow ashy and doubtful blue. Dembowski, 1854—57.
Sometimes blue, sometimes yellow. Secchi, 1855—57.
" At one time ruddy, at another time, bluish, apparently changing white being looked at; a versatility of hue which I have remarked in other stars similarly circumstanced." Webb, 1850—5.

55. Mu Cygni, 5 : 6.—White and pale blue. Struve, 1831.
Yellow and more yellow. Sestini, 1844.
Reddish yellow and olive. Dembowski, 1853—4.
Clear light yellow and ashy yellow. Dembowski, 1855.
" The 5 yellow, while the 6 showed the curious effect of an undecided and changeable hue—blue and tawny." Webb, 1850—1.
The 5 yellow. Webb, 1862.
"Secchi's colors are here uncertain and variable."

56. Alpha Piscium, 5 : 6.—Greenish and pale blue. " There seems to be something peculiar in the color of the smaller star, as to which observers are strongly at variance with each other, and even with themselves. Some see no contrast, some agree with Smyth, some find it tawny and ruddy. The details are curious but too long for insertion here. Other small stars show a similar uncertainty." Webb.

The frequent changes in some of these stars,—the last three or four of this Catalogue especially,—are remarkable, and seem inexplicable to astronomers. I presume the difficulty arises, not as is supposed from the atmosphere, or from the instruments, or from personal peculiarities, but chiefly from the frequency of the real changes in the stars. If, for instance, it be complained that " Secchi's colors are uncertain and variable," it is because in such instances the colors of the stars are uncertain and variable.

An addition has been made to the title of this Catalogue to obviate the objection that possibly some of the apparent changes of color of the stars may be merely the errors of observation, or the effects of the atmosphere, and not real changes in the celestial bodies. Nevertheless, an apparent change is a fact in the constitution of the world, and deserves a notice and an explanation. From whatever causes these changes may arise, there is needed a faithful collection of all the facts in this department of astronomy. They are scattered about in many volumes and many various scientific depositories, and no one, as far as I am aware, has brought them together or made them a special study. But in making such a collection, or catalogue, no changes should be omitted. Whether we regard them as apparent or real, whether they be small or great, whether they may have been slow or sudden, none should be suppressed by the compiler in his catalogue. To admit some and reject others because in his opinion some are right and others are wrong, would be making his work a confused medley of facts and opinions unworthy of reliance. If, as appears undeniable, there be changes in the colors of the stars, then, from the nature of things, there may be small changes as well as great ones. To reject a recorded change simply because it is small, would therefore be a real misrepresentation of the case, and a virtual falsification of the records. Moreover, the colors as they stand recorded are from experienced observers,—men whose lives have been devoted to an accurate representation of facts, who do nothing without care and deliberation, and whose common and avowed practice is not to record any color when the atmosphere is not favorable for such observations.

As already stated, there are difficulties in deciding on colors by the naked eye when the star is not large, and when the departure from white is small. But this difficulty is not in the way of large stars, as Arcturus and Sirius; nor does it apply to the telescope, except in the very smallest magnitudes. To decide between two different colors, such as red and blue, is never difficult; and when two colors are blended, it is the custom to name them both, as bluish green, reddish yellow, and the like. The disturbing effects of the atmosphere, or of the instrument, may be detected either immediately or after several nights of observation. The atmosphere cannot color one star and leave all the other stars in the same neighborhood uncolored. The telescope cannot act peculiarly on any one star; it must treat all alike, especially of the same magnitude and color. Simple comparison is therefore an admirable test; and another important test is time—watchfulness every night through different changes of weather. If hereafter even this shall not be found satisfactory in any one locality, then simultaneous observations at widely distant places will most certainly eliminate all suspicion of mistake. For instance, observations may be made at Australia, the Cape of Good Hope, and Chili in the southern hemisphere; and in the northern hemisphere both on the Pacific and Atlantic coasts of America, on the Atlantic coast of Europe, in Russia, and in Hindoostan. If the star shall prove of the same color at all these different regions at the same time in favorable weather, then that color may be regarded as unquestionable. Even by using one locality alone absolute certainty may be acquired,—as the red colors of Aldebaran, Betelgueze, and Antares. The same certainty may be looked for in this as in other departments of astronomy, and even greater certainty than in many. There is an uncertainty, in opinions of wise men, of three millions of miles in the distance of the earth from the sun; and yet this uncertain distance is used as a measuring line to fathom other and far greater distances. But this uncertainty to so large a degree does not take away from the supreme value of the determinations nevertheless. These determinations, with all their known reservations, are held as of the highest importance. So in the colors of the stars; mistakes may be made, the intermixtures of error may certainly exist, though we cannot tell exactly where they are, and yet the present recorded observations are precious beyond estimation. And a time is coming when simultaneous observations from various positions in both hemispheres will render them beyond suspicion. To hasten on this time we have only to make good use of the materials already on hand.

Why the changes in the colors of the stars are not more frequently observed, was pointed out in a former communication. Why the belief in their real occurrence is hard to be admitted, and why their observed changes are ascribed to supposable errors from the instruments, from the atmosphere, and from personal deficiencies, seems to arise from the opinion that such vast bodies cannot possibly undergo great changes in a short time. But this opinion rests on no known scientific grounds. When fairly viewed, the fixedness of the colors of the stars should not seem more likely than the fixedness of their positions. Indeed the two ideas are very much alike. In ancient phrase, the stars were said to be " rivetted " to the vault of heaven. Now we know from observations more refined that many of them move, and we have a conviction, from the nature of attraction, that they must all move. In like manner, in a universe where every known object is subject to change in various ways, our first ideas should be that the colors of all the stars must change. Hence we should approach the recorded changes with favorable judgments. If we are to have any prepossessions in the case, they should be that the changes are real in the stars themselves. And when we reflect on the habitual caution of long experienced observers, men whose very existence is devoted to the accurate delineation of fact, we should place a high reliance on their recorded observations, and not think that they have lightly allowed themselves to be imposed upon by optical illusions.

I cannot hope to be able to add anything to the knowledge of practised observers respecting the sources of error and the rules to be observed in making observations; but as these have never, that I am aware, been embodied in print, I offer the following, chiefly for the assistance of the many who may be disposed so observe the larger stars with the naked eyes. Such stars are indeed very few, but the observations may be the more useful from being made frequently and by many persons.

1. Damp and slightly hazy atmospheres make a green star appear blue. This may be from the same principle that the deep ocean, the clear sky, and the distant mountains appear blue. Damp nights that are perfectly clear do not have this effect.

2. Moonlight greatly obscures the colors of the stars, giving them a yellowish hue.

3. Before the daybreak makes its appearance in the east, the rays of the sun refracted through the higher regions of the atmosphere, may cause a general whiteness of the stars.

4. Artificial lights reaching the eye obscure the colors of the stars.

5. On account of the faintness of the light of the stars, the eye often requires to be fixed upon them for a considerable time before their impressions take full effect.

6. Comparisons between neighboring stars, and some practice in star observations, are often necessary to decide on the real colors of the stars.

7. The atmosphere must have like effects upon similar stars in the same neighborhood. Hence a peculiarity observed in any star may be brought to a determination.

8. Observations on the same star during a considerable interval of time and through different changes of weather, may aid in giving confidence to a determination.

9. Perfect independence and çandor are necessary. Our previous judgments are apt to warp these delicate impressions on the retina, and whether we have derived these judgments from ourselves or others, we must be careful to lay them completely aside. For want of doing this we may not notice a change of color, although such a change may have been before our vision.

10. Personal peculiarities of vision may be ascertained by consultation with others.

11. Discrepancies between the accounts of two observers may arise from differences of dates; hence, in apprehension of sudden and frequent changes in the stars, the dates of observations should be carefully given.

Description of a new Labroid Genus allied to TROCHOCOPUS Gthr.

BY THEODORE GILL.

Dr. Ayres has indicated, under the name *Labrus pulcher*, a Californian representative of the family of Labroids. That species was subsequently referred by Dr. Günther to his genus *Semicossyphus*, in which it was retained by myself with the proviso that "its generic position remains to be confirmed, although there is little doubt that it really is a *Semicossyphus*." Having since received, through the kindness of Dr. Cooper, a specimen of the species, I find that it has not the "lateral teeth distinct," as in *Semicossyphus*, but an "obtuse osseous ridge round the edge of the jaws, without distinct lateral teeth," as in *Trochocopus* Gthr., to which Günther should have referred it. I am not acquainted with his reasons for considering the species closely related to the type of *Semicossyphus*, but previously followed him, as he was acquainted with *Semicossyphus* and *Trochocopus* through autopsy, while I was not.

Genus PIMELOMETOPON Gill.

Synonymy.

Labrus sp. *Ayres.*
Semicossyphus sp. *Günther*, *Gill.*

Body oblong, moderately compressed, with the caudal peduncle little oblong and not constricted: anus subcentral.

Scales generally rather small, in about fifty-five to sixty-five transverse rows; on the breast smallest: each scale is oblong, subangulated behind, little convex or truncated at base, corrugated at the centre, with numerous lines radiating backwards towards the base and sides; and in front with generally undulated lines parallel with the sides; exposed surface vertically rhomboid.

Lateral line continuous, simply tubular, parallel with the dorsal outline, little decurved backwards, and not at all deflected.

Head nearly equally long and high, with the snout elongated and decurved. Eyes submedian between the snout and opercular margin or little anterior, rather small. Cheeks covered with small scales; larger ones on all the opercular bones, except the preoperculum, whose limbs are naked. Opercular bones unarmed; suboperculum with no membranaceous extension. Nostrils minute, simple, in front of the upper portion of the eye.

Mouth little protractile, with the cleft oblique. Lips thick and plicated.

Intermaxillary and supramaxillary bones connected by arthrodial articulation; intermaxillaries with the ascending processes about as long as the horizontal and extending nearly to the eyes, little curved and oblong cuneiform in profile for two-thirds of their length, oblong subtrihedral behind; the horizontal limbs uniformly wide, thick but compressed, and with a prominent articulation behind. Supramaxillars divided into two parts; an anterior laminar behind and within the posterior part, widening towards the front into a somewhat concave or channeled process arthrodially articulated with the outer surface of the intermaxillars, and thence recurrent in a nearly parabolic curve backwards and thence downwards to the front to articulate with the inner surface of the intermaxillars; the posterior portion of the supramaxillars is flat and expanded backwards towards its inferior angle, and ceases nearly under the front of the eye. Dentary rapidly increasing in height towards the angle.

Teeth on the crest of the jaws cylindro-conic and obtuse, completely isolated; four in front of the jaws developed as large curved blunt canines; the hindermost one in jaw above sometimes little larger than the preceding; in others a true canine:* on the *inner surface* of the jaws, granular and pluriserial.

Branchiostegal rays seven (in *Pimelometopon Darwinii* fide Val.

Dorsal fin wih no scales, entire, commencing rather behind the bases of the pectoral fins; typically with twelve spines and ten rays; the spinous portion nearly uniform, rather low, and with each spine enveloped in a membranaceous produced sheath; the soft portion falciform, produced at its anterior portion.

Anal fin with three graduated spines, and with its soft portion opposite and similar to that of the dorsal.

Caudal fin typically lunate and with prolonged pointed lobes.

Pectoral fins rather narrow, obliquely truncated behind.

Ventral fins inserted beneath or scarcely behind the pectoral and angulated.

D. XII. 10. A. III. 12.

Scales 58—62.

The lower pharyngeal bone is T-shaped, divided into two parts; the body transversely triangular, scarcely sinuous behind and uniformly high, with its ends scarcely curved backwards to its posterior facettes, which are narrow, little prominent above and separated from the dentigerous area by a contraction; the shaft is laminar, expanded obliquely downwards and forwards. The teeth on the body are nearly uniform, moderate, and paved, and on the crest of the shaft obtusely cylindro-conic. The upper pharyngeal bones are high, curved in front, on which is a tessellated pavement and which is nearly rectangular to the inferior surface, which is paved towards the inner side with moderate and towards the outer with minute teeth.

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* Is the development of a posterior canine tooth a sexual distinction in this genus?

The gill rakers on the outer surface of the first branchial arch are short compressed, parallel with the arch, bi- or multidentate; the others are oblique and more or less compressed at right angle to the arches.

Type Pimelometopon pulcher *Gill.*

This genus is very closely related to *Trochocopus* (Günther), but differs in the possession of a greater number of scales and the form of the head. It is also solely represented by species found along the western coasts of America and the appertaining islands, while *Trochocopus* is a peculiar African type, so far as yet known.

Of the two known species of this genus, one—the type—was originally described as a *Labrus* by Ayres in San Francisco; the other was first made known by Jenyns under the generic name *Cossyphus* and was afterwards, by Valenciennes, described as a new species of *Labrus*. Dr. Günther subsequently referred the Californian species to his genus *Semicossyphus* and the species of Jenyns and Valenciennes to *Trochocopus;* he was acquainted with neither through autopsy. Finally, the writer, following Günther and unacquainted with either *Semicossyphus* or *Trochocopus*, retained the Californian species in the former genus.

Pimelomotopon belongs to the subfamily of Chœropinæ as understood by me. It is proper to here remark that, by an evident inadvertence, the subfamily Pseudolabriformes of Bleeker was formerly[*] enumerated among those considered valid by myself, instead of among those requiring revision.

There are two known species of the genus *Pimelometopon:*

PIMELOMETOPON PULCHER Gill = Labrus pulcher *Ayres* = Semicossyphus pulcher *Günther*, *Gill.*

California.

PIMELOMETOPON DARWINII Gill = Cossyphus Darwinii *Jenyns* = Labrus aper *Val.*

Gallopagos Islands.

N. B. In anticipation of a special paper, I may here state that the *Sebastes! helvomaculatus* of Ayres is the true *Sebastes rosaceus* of Girard, (*Sebastomus*[†] *rosaceus* Gill,) widely different from the *Sebastodes! rosaceus* of Ayres. The latter may be named *Sebastosomus pinniger*.

Note on the Nomenclature of Genera and Species of the Family ECHENEIDOIDÆ.

BY THEODORE GILL.

In order to correct the nomenclature of two of the genera of the family Echeneidoidæ, the following paper is submitted. I also embrace the opportunity of restoring to proper rank, as the true names of peculiar species, two which have been connected with forms to which they do not truly belong.

M. Auguste Duméril, in a "Prodrome" of a projected Monograph of the family, (Comptes Rendus, tome 47, 1858, pp. 374—378,) has proposed to distribute the species among two groups, one typified by *Echeneis naucrates*, and named *Naucrates*, and the other, represented by *E. remora* and called *Remores*. Elevating these types with others to independent generic rank, I have restricted *Echeneis* to the genus typified by *E. naucrates* and called that one typified by *E. remora*, *Remora*, which name Dr. Bleeker has since accepted. On examining the works of Linnæus and Artedi, I find, however, that *E. remora* was the only species referred to that genus by Linnæus in the earlier editions of the Systema Naturæ, and by Artedi; and that in the later editions, Linnæus placed that species at the head of the genus. The *E. remora* must consequently be regarded as the type of the genus, and a new name (*Leptecheneis*) conferred on *E. naucrates*. The genera of Echeneidoidæ will then be known by the following names:

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[*] Proc. A. N. S. 1863, p. 221.

[†] Sebastosomus, n. g. Type *Sebastosomus melanops* = Sebastes melanops *Girard.*

REMORÆ.

ECHENEIS REMORA L.

1. Echeneis *L.*, *Art.* Type, Echeneis remora *L.*
2. Remoropsis *Gill.* Type, Echeneis brachyptera *Lowe.*
3. Rhombochirus *Gill.* Type, Echeneis osteochir *Cuv.*
4. Remilegia *Gill.* Type, Echeneis australis *Bennet* = Echeneis scutata *Günther.*

LEPTECHENEIDES.

5. Leptecheneis *Gill.* Type, Echeneis neucrates *L.*
6. Phtheirichthys *Gill.* Type Echeneis lineatus *Menzies.*

In a Synopsis given in the Proceedings of the Academy of Natural Sciences of Philada., for April, 1862, (p. 239,) an analytical table is given, in which the genera are distributed as follows:

Echeneides (Echeneis = Leptecheneis, Phtheirichthys.)
Remoræ (Remora = Echeneis, Remilegia.)

Subsequently, (op. cit., 1863, p. 88,) the genera *Remoropsis* and *Rhombochirus* were added.

The genus *Remilegia* is known to me chiefly through the excellent figure accompanying Günther's valuable account of the family in the "Annals and Magazine of Natural History," (vol. v. 1860, pp. 386—402.) On the other hand, I have enjoyed the opportunity of examining two types,—*Rhombochirus* and *Phtheirichthys*,—not seen by that gentleman.

While fully appreciating the great service rendered to science by Dr. Günther in reducing the synonymy of the present family, and in many respects agreeing with him in his views regarding the limits of the species and their synonymy, I am compelled to differ from him, especially regarding the nomenclature of the species called by him *Echeneis Holbrookii* Gthr., and *E. scutata* Gthr., believing that both had long previously received names known, indeed, to him, but referred to species which they did not really represent.

Echeneis Holbrooki of Günther, Cat., should have been called *Echeneis albicauda*, as it is the *Echeneis albicauda* of Mitchill. Mitchill's name is, indeed, included, with special emphasis, in the synonymy of Günther's *Echeneis naucrates* (*Leptecheneis neucrates*), but the following juxtaposition of *all essential characters* given by both authors will show the incorrectness of this view:

"*E. naucrates.*"	"*E. Holbrookii.*"	"*E. albicauda.*"
Disk "(21) 22—25 (26)"	Disk "21."	Disk "21."
"The length of the disk $4\frac{1}{2}$—$4\frac{3}{5}$ in the total or twice the width of the body between the pectorals." Gthr., ii. p. 384.	"The length of the disk is $3\frac{4}{5}$ in the total, or twice the width of the body between the pectorals." Gthr., ii. 383.	"Length twenty inches and a half; breadth almost three." Mitchill.
Width to length (= 1: $4\frac{1}{2}$ — $4\frac{3}{5}$ × 2) = 1: 9 — $8\frac{1}{5}$.	Length to width = 1: ($3\frac{4}{5}$ × 2) $7\frac{3}{5}$.	Length to width = 1: ($20\frac{1}{2}$ ÷ 3 =) $6\frac{4}{5}$.

As Mitchill's notice of *Echeneis albicauda* gives a relative width, to the body even greater than that attributed by Günther to his *E. Holbrookii*, and far greater than that assigned by him to *E. naucrates*, and as *Echeneis albicauda* has "twenty-one bars across the shield," also in *E. Holbrookii* "the number of laminæ has been constantly found to be twenty-one—a number of very rare occurrence in *E. naucrates*,"—the reasons for Günther's insistence on the reference of Mitchill's name to *E. naucrates* and bestowal of a new one on his species are not evident. I cannot appreciate the force of his remark that Mitchill's "is an imaginary species," and that the name, "as is quite clear, was originally not intended for the fish afterwards described by Holbrook as *E. lineata*, but merely for specimens of *E. naucrates* with a white margin to the fins."

Long before the communications of Mitchill, and as early as the year 1788, a species of the genus *Leptecheneis* was made known by Zuiew in a special article (*Echeneidis* nova species) in the Nova Acta Academiæ Scientiarum Imperialis Petropolitanæ (iv. 279—283, tab. VI.) The species was well and elaborately described and illustrated, and was especially distinguished from *E. naucrates* by the much longer lower jaw and the longer disk, which nevertheless had a smaller number of laminæ (20.) The species thus introduced was named *Echeneis neucratoides;* its habitat was unknown.

While it is thus seen that two forms with a comparatively small number of laminæ had been early made known, and that the proportions assigned to one agreed nearly with those attributed to *E. Holbrookii* by Günther, it is necessary to add that none of the specimens examined by myself had so long a disk or so wide a body as the individuals noticed by Günther, although I have had the opportunity of examining specimens of the genus exhibiting every gradation between *eighteen* and twenty-five laminæ. I shall not, however, offer any decided opinion at present, but close with the assertion that DeKay's and Holbrook's specimens had not the proportions of the *E. Holbrookii* of the Acanthopterygian Fishes, but agreed with those seen by myself. As Günther's *E. Holbrookii* was *entirely* founded on the *E. lineata* of Holbrook in the first instance, that name must of course be considered as a synonym.

The *Echeneis scutata* of Günther had first received a name from F. D. Bennett in his "Narrative of a Whaling Voyage round the Globe, from the year 1833 to 1836."[*] In that work, Bennett gave a very recognizable description of it under the name *Echeneis australis.*[†] Bennett's name has been referred by Günther to the synonymy of *Leptecheneis neucrates*, like *E. albicauda*, but, as will be shown, erroneously. Bennett has stated that the *E. australis* exceeds the *E. remora*—especially recognized by Günther as that species—in size. "One individual captured, and which was by no means the largest one observed, measured one foot five inches in length, *and was proportionally broad.*" This statement at once would render the identity of the species with *E. naucrates* extremely improbable, as the latter species has an incomparably more slender body. The further statement that the dorsal has "21" rays, and the anal "24," completes the evidence of its difference from *L. neucrates*, that species having the formula D. "(21) 22—25 (26) 33—41. A 32—38," (Günther). As Bennett's formula ("D. 21. A. 24") specially agrees with Günther's formula of *E. scutata*—("D. 27 | 22. A. 21—23"), and, as of three examples of Bennett's species, "one only had 24 striæ on the buckler, the other two had 26," thus also specifically agreeing with *E. scutata* ("D. 27 | "), the identity of the two nominal species is almost certain, and Bennett's name (*Remilegia australis*,) as the prior one, must be accepted.

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[*] Op. cit., vol. ii. 1840, p. 273.

[†] The name of *Echeneis australis* was first introduced into Science by Bennett, as that of a new species. A *Leptecheneis*—probably *L. neucrates*—had been previously figured in Griffith's Cuvier under the English name of "Australian remora," but no attempt at identification of the two was made by Bennett, and the species belong to widely distinct genera.

(Communicated by the Smithsonian Institution.)

Notes on the BIRDS of Jamaica.

BY W. T. MARCH.

With remarks by S F. BAIRD.

III.

ARDEIDÆ.

All the North American Ardeidæ are to be obtained in the Island of Jamaica. The Gaulins and Bitterns are of more frequent occurrence than the larger Herons, and are found at all seasons and in every part of the island where there is water,—at the cattle ponds, along the river courses, in the mangrove swamps, lagoons, and marshes, and in considerable numbers on the neighboring islets and kays during the breeding season. The Ardeidæ all build on trees; the nests are platforms, constructed of sticks filled in with leaves, trash, twigs and bark, forming a shallow bedding, on which the eggs are deposited. In the mangroves the nest is composed principally of the decaying pods of the black mangrove.

The eggs of all are emerald green, or rather, of the tint called aquamarine, varying in shade, and in dimensions according to the size of the bird; those of the Gaulins are four or five in number, measuring about $1\frac{13}{16}$ by $1\frac{5}{16}$ of an inch; the typical eggs rounded at both ends, though some are pointed at one end; a small kay off Old Harbor, known as Barebush Kay, is a favorite resort of all the Gaulins, Bitterns and Night Herons during the breeding season.

The larger Herons are not of so frequent occurrence as the Gaulins and other Ardeidæ during the late spring and summer months; but *Ardea herodias* and *Herodias egretta* are not uncommon during the autumn and winter; they are, however, more difficult of approach than the smaller species, being very wary and vigilant; their resort during the breeding season is usually to the deep recesses of the mangrove swamps and morasses. Their eggs are of similar form and color, but larger than those of the Night Heron. I have not often met with the nest of the larger Herons; but have notes of two,—one from Salt Island Creek, *Herodias egretta*, containing three eggs, and the other, *Ardea herodias* with four eggs from the Ferry Lagoon. On both occasions the nests were taken from the topmost branches of a Corkwood (*Anona palustris*). The Herons are generally in good condition from the fall of the year until the following spring, but, as with most of the fish-feeding birds, must be divested of the skin, which otherwise imparts a rank and unpleasant flavor to the flesh.

There are periods, but not of long continuance, in which the Egrets, particularly the White, are seen several together, in our marshes. The number may be twelve or twenty. They seem attracted by some prevalent living food on these occasions; ordinarily they feed singly, or at most in couples, in the shaded spots of our rivers above the water shoal. There are collected at the present time (January, 1864) at a sedgy pond near Spanish Town upwards of twenty, principally *Garzetta candidissima*, with a few of *Herodias egretta*, *Florida cœrulea* and *Demiegretta ludoviciana* and *nivea*.

110. FLORIDA CÆRULEA.—The length of the Blue Gaulin or Florida Heron is about 22 inches, expanse 36½, flexure 11, leg 4, bill 3; occipital feathers lengthened, without a crest; prevailing color dark indigo blue, head and neck with a purplish tinge; dorsal plumes lengthened; wing feathers greyish beneath; iris yellow, orbits light blue, bill leaden blue; legs and feet black. The young are white with spots of blue about the wings and body;

iris whitish, orbits and base of the bill yellowish, bill light blue, legs dull yellowish, bill light blue, legs dull green.

109. Garzetta candidissima.—I find the Snowy Heron of as frequent occurrence as the Red-Necked and Blue Gaulin. Color snowy white, with occipital and dorsal plumes loosely fibred and much lengthened. Iris yellowish, bill black, with the base and lower portion of the lower mandible and space round the eye yellow; legs black, feet yellow; length 26 inches, expanse 37½, flexure 10½, leg 4, bill 3¼, middle toe 3.

108. Garzetta nivea.—Mr. Gosse's Common Gaulin has been supposed to be the immature "*Florida cærulea*," but I think, on careful examination and comparison, it is quite distinct,—the color is always pure white, without any blue feathers about the body or wings, or any distinct crest. The tips of the first six wing quills only are edged on both webs with greyish black. Iris pale yellow; orbits, cheeks and legs bluish green; bill bluish black, with the base and larger portion of the lower mandible yellow. Length 24 inches, expanse 39, flexure 10½, leg 4, bill 3¼, tail 4½.

111. Demiegretta ludoviciana.—The Red-necked Egret, or Gaulin, is one of the most common. The general color of the adult above is slatey blue, the feathers tipped with reddish; chin and a stripe down the throat and other under parts tawney white; breast and neck red, shaded into purplish. Iris yellowish white; space round the eye fulvous; bill brownish black, lower mandible clayish yellow beneath; legs yellowish green. Length 25½ inches, expanse 37, flexure 10½, bill and leg 4 each. The white occipital and colored dorsal plumes straight, fastigiate, the latter generally longer than the tail. The immature bird has the upper plumage reddish, mixed with blue.

Demiegretta rufa.—The Reddish Egret or Gaulin is scarce, as I have only seen two specimens; it appears to be only an occasional visitor.

Adult.—General color greyish blue, paler beneath; head, neck and throat reddish chestnut. Dorsal plumes with yellowish tips, straight, fastigiate, and longer than the tail. Iris greyish white, space round the eye and bill dull flesh-color; the terminal half of the bill black, legs and feet blue, with blackish scales; claws blackish. Length 30 inches, expanse 43, flexure 12¾, leg 5¾, bill 3½.

116. Herodias egretta.—The White Egret or Heron is the most common of the larger species. The dimensions are, length 38 inches, expanse 55, or more, flexure 16, tail 5, bill more than 5, and leg nearly 6 inches. Color pure white; no occipital crest. Dorsal plumes with stiffened shafts, longer than the tail and pendant. Iris yellow; bill yellowish to the point, dusky above, legs and feet black.

163. Ardea occidentalis.—The Great White Heron is rare in the island; it is readily distinguished from the preceding by the larger size, the lengthened occipital feathers, and an absence of the dorsal plumes and some other peculiarities. The color is also pure white. Iris yellow, orbits yellowish green, bill yellow, greenish at the base; legs yellow, with olive tinge in front, claws light brownish. Length 45 inches, expanse 68, or more, flexure nearly 20, leg nearly 9 inches, bill 5½.

115. Ardea herodias.—The Great Blue Heron is more abundant in some years than in others. The prevailing color is ashy blue, some feathers tinged reddish; crown feathers and scapulars elongated; chin and under tail coverts white; edge of wing and a patch on shoulder rufous and white; neck ashy cinnamon brown; color of throat white, streaked with black and reddish brown; plumes of the breast ashy and white; belly streaked black and

white; sides black. Wing quills blackish; thigh rufous; tail bluish. Iris yellowish, with hazel pupil; bill with lower mandible yellow, dark flesh-colored at the base; upper mandible reddish horn, lighter on the edges; tongue whitish, mouth deep rosy flesh-colored; leg, feet and claws black, scales with whitish edges; thighs, a short space from the knee, and a stripe back and front black, the rest tawny; palms dull clayish.

The dimensions of the adult male are, length 46 inches, expanse 74, flexure 19, bill 6¼, leg 7, thigh 9, middle toe 4¾.

This species is very variable, rarely agreeing exactly in the dimensions and in the coloring of the head and belly. The female and young male generally have the head black without the white center, and the breast and under tail coverts greyish, streaked with white and blackish. The sack or stomach of one shot at the river side near Spanish Town was filled with small river shrimps and water snails, intermixed with small pieces of river grass (*Ceratophyllum demersum*) evidently pulled up in taking the food; and in the gullet of another shot at Great Salt Pond was a mullet nearly eight inches in length.

275. Ardea Wurdemannii?—The White-crowned Heron is in the upper plumage very like the preceding, but has the crown and occipital elongated feathers white; the under parts white, streaked with black; the breast bluish black, with bluish grey or ashy on the sides. Length nearly 50 inches, expanse 75 or more, flexure 21, leg 8, middle toe about 13, thigh 9, bill 6½. Greenish brown, yellowish beneath.

The fishermen and gunners on the coast say this is the male of the preceding species in summer plumage, but, from two specimens I have collected, I think they are quite distinct.

113. Ardetta exilis.—The Tortoise-shell Bittern is not uncommon among the mangroves and along the banks of streams. It is generally found solitary. Length 13½ inches, expanse 17 to 18, flexure 4½ to 5, bill and leg each nearly 2. The prevailing colors of this Bittern are dark glossy green and purplish cinnamon mixed with tawny. Iris and bill yellow, the latter darker at the tips, legs tawny. The head and back of the female are chestnut instead of green and cinnamon. The eggs are small.

112. Butorides virescens.—The Crab Catcher is found as a solitary bird in almost every locality in which there is water. The dimensions are, length 17 to 20 inches, expanse 25 to 28, flexure 7 to 8, leg and bill 2 to 2½. Head with crest glossy green, upper parts of body green, wing coverts edged with tawny brown; neck and sides of throat chestnut; chin white; line down the centre of throat white, intermixed with greenish and chestnut; under parts and sides leaden ash. Iris yellow; upper mandible black, lower mandible yellow, with black edge; legs and feets dusky greenish yellow. The mature male has two stripes on the side of the head towards the ear, with a white stripe streaked with black between them.

This species also builds on trees in the morasses and swamps, and on river banks overhanging the streams. The eggs are nearly as large as those of the Gaulins.

Butorides brunnescens.—A Cuban species is supposed to be found here, but I have not recognized it in any of my collections. From Gundlach's description this differs from the preceding in having the tip of the lower mandible greenish white; skin of face olive black; round the eye yellowish green; legs olive brown; lesser wing coverts and small quills dark metallic green, with rusty edges; large quills without white; lesser under coverts grey; Throat yellowish brown, dark grey at base; foreneck blackish, with metallic green lustre, rusty tips and pale yellowish lateral edges. It also wants the white and black streaked line from the angle of the mouth towards the ear and the white on the throat and forepart of the neck, which are uniform with the rest of the neck.

117. Botaurus lentiginosus.—This Bittern is occasionally met with about the river banks, lagoons and swamps. Iris yellow; feet grayish yellow; bill yellowish green, blackish at the points. Length 26 inches, expanse 40, flexure 12. Prevailing color brownish yellow, mottled and shaded darker with reddish and brown and cinnamon brown; a black stripe on each side of the neck; chin and upper throat white, streaked with brown. I have not met with the nest.

114. Nyctiardea gardeni.—The Night Heron or Quok is often met with about the lagoons and swamps. Length 25 to 30 inches, expanse 40 to 45, flexure 12 to 13, bill and leg a little more than 3 inches. Iris red, orbits green; bill black; legs and feet yellow, claws brown; head, crest, scapulars and back glossy metallic green; long feathers of occipital crest forehead and under parts white, passing into pale slaty blue; the wings and tail ashy blue. The young differ in having the green of the upper parts replaced by dull chocolate; the coverts spotted white; the neck and under parts streaked with dusky; the quills tinged with reddish chocolate, and tipped whitish.

120. Nyctherodius violaceus.—The yellow-crowned Night Heron or Guinea-hen Quok, is also of frequent occurrence. Dimensions rather less than the preceding; the bill thicker and shorter. Iris reddish; bill dark or blackish green; legs greenish yellow above, greenish black below; the prevailing color greyish leaden blue, lighter below; top of the head and occipital feathers yellowish white, surrounded with bluish black; quills and tail dull lead color; the young has the upper parts greenish olive, with central streaks and terminal spots of brownish yellow; the under parts whitish, with yellowish brown streaks. The night Herons build lower than the other species of *Ardeidæ*. The eggs of the two species are alike, rounded at both ends.

TANTALIDÆ.

121. Ibis alba, the White Curlew. Ibis ——, the Black Curlew.—The haunts of these two (?) species of Ibis appear to be almost confined to the morass borders of the islets off Salt Island and Bushy Park Lands, formed by the growth of mangroves, and intersected by natural channels flowing between; the Curlews breed, and are to be found there at all seasons, only visiting the mainland in August and sometimes in September. The first species is pure white, with the first five wing quills tipped with greenish black. The other is also white, with the head, neck, wings, and tail of a glossy greenish black. The flesh is equal to that of the wild goose.*

119. Ibis rubra.—The red Curlew is a rare visitor on the south midland coast; but has been more frequently seen at the western end of the island. I have never met with it.

118. Platalea ajaja.—The roseate Spoonbill is of very rare occurrence. I have only seen portions of one, shot by Mr. Maxwell in Saint Elizabeth, many years ago. †

143. Phænicopterus ruber.—The red Flamingo was formerly a frequent visitor at the west end of the island, but rarely seen on the south midland or eastern coast. ‡

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*(Note by Mr. Richard Hill.) It has not been mentioned by naturalists that the Curlew has the power of inflexing the upper bill, so as to run it along the groove of the lower mandible, and clean out whatever may be adhering there.

†(Note by Mr. Hill.) Occasionally specimens have been procured from the salinas of Old Harbour. Twice, specimens have been brought me, but so badly skinned as to be worthless for the cabinet. The color was of a delicate equally tinted rosy red.

‡(Note by Mr. Hill.) In 1841 a fine rose-tinted bird was shot at Passage Fort. The bird was forwarded by Mr. Kirkpatrick, but never came to hand. Some of the feathers were separately sent and received

Many species of Plovers and Snipes are regular annual visitors; they come in considerable numbers with the autumnal rains, in the early part of October, (some are rather earlier in their advent,) and depart, many, before the end of the year; whilst others remain until February, or later in the succeeding year. On the arrival of the migratory flocks in autumn, they range all over the island where water is to be found. Some species are found during the entire year, the number depending apparently on the signs of the coming seasons; during the dry summer of 1863 they were more abundant than in 1861 or 1862; some of the summer residents breed in the high lands, but the greater number of them are found on the plains and near the coast.

CHARADRIIDÆ.

ÆGIALITES MELODUS.—The Piping Plover is, according to Gosse, an annual visitor, but I have not met it in any of my collections. Mr. Gosse may possibly have mistaken the following species for it.

103, 260 ÆGIALITES WILSONIUS.—The Thick-billed Plover is easily recognised by the bill; it is one of the permanent residents, and, I think, is more numerous during the summer than any of the other species of *Aegialites;* the migrants generally arrive in September, and depart in the early part of the following year, leaving, however, numbers widely distributed inland, as well as on the coast. It lays on the bare sand like the *Chordeiles*, sometimes, but not often, near the cover of some low shrub. I have not met with more than three eggs in a nest; they are in form like the Quails, stone color, splashed all over with small spots of bistre and vandyke brown, and measuring 1½ by 1¼. Several species of *Aegialites* are said to breed in Saint Elizabeth and Westmoreland. *A. vociferus* and *tenuirostris* may be among them.

102, 256. ÆGIALITES SEMIPALMATUS.—The Ring Plover is also a summer resident, but is not so numerous as the last species. I have collected specimens through the spring and summer months, but I have never met with the eggs, though they must certainly breed here, as one of my sons took from one spot in July last, at Great Salt Pond, a broken egg perfectly shelled; it was dark grey apparently without, or with only minute dots.

The other Plovers, visiting the island in autumn and winter, are—

105, 204. CHARADRIUS VIRGINICUS.—The Golden Plover.

99. ÆGIALITES VOCIFERUS.—The Kildeer Plover.

106, 203. SQUATAROLA HELVETICA.—The Squatting Plover.

182. LIMOSA?—The Horse-eyed Plover.

I have not met with any of these during the summer in the south midland district; the three first are constant annual visitors; the last is only obtained occasionally.

HÆMATOPODIDÆ.

107, 257. STREPSILAS INTERPRES.—The Turnstone is the most abundant of the Grallæ found here at all seasons, and I have met with their eggs more frequently than those of any other species—at the seaside—on the plains—in the mountains. I have found eggs at Healthshire, Great Salt Pond, Passage Fort, and in St. John, St. Thomas in the Vale, and on the bank of the Rio Grande, near Millbank in Portland. The eggs are deposited on a few dried leaves under low growing shrubs, (on the coast generally under the *Surianna Maritima;*) they are yellowish, or olive green, coarsely marked and streaked with dark and light brown, and slatey grey spots intermixed.

RECURVIROSTRIDÆ.

141. **Himantopus nigricollis.**—I have found the Stilt Plover about the salinas along the coast from Port Royal to Old Harbour, during the entire year; they are often seen about the flashes made by the inroad of the Rio Cobre at Passage Fort and the Salt Pans, and Salina at Hanson's or Great Salt Pond, (and I make no doubt they breed throughout the island.) The eggs are generally found in a tussock of grass; from recollection they are stone color, splashed all over with vandyke brown and pale bistre spots.

Recurvirostra americana.—The American Avoset has been identified by Mr. Hill; it must be a rare visitor, as I have never met with it.

SCOLOPACIDÆ.

242, 255. **Actodromas minutilla.**—The little Sand-pipers are found at all seasons, though most abundant in the late autumn and early winter months; they are not, however, uncommon during the spring and summer. They breed on the salinas and sandy beach, laying three or four eggs on the bare sand; these are yellowish, splashed with reddish brown and greyish spots principally about the large end. I have had eggs from Great Salt Pond and Passage Fort.

129, 131. **Calidris arenaria.**—The Sanderling is a regular annual visitor. I have a pair shot at Great Salt Pond on the 20th August, 1863.

205, 254. **Micropalama himantopus.**—The Stilt Sandpiper is not uncommon during the spring and summer. I have not met with the egg, though I am sure it must breed here, as I have specimens of birds collected in April, June and August of 1863.

130. **Symphemia semipalmata.**—The Willet, known here as the Spanish Plover, is not uncommon in some years during and after the autumnal rains. I have never seen it in summer, though it is said to breed in Saint Elizabeth.

124. **Rhyacophilus solitarius.**—The Solitary or Pond Snipe is never seen in company—a single bird or pair only is found usually about the cattle ponds. The eggs are laid on the bare ground. I have taken several nests, but have no certain recollection of the eggs.

128. **Tringa canutus.**—The Knit or White-bellied Snipe is also found in solitary loneliness on river banks, or marshy borders of ponds or fresh water streams, at all seasons of the year, but I have not yet met with the eggs.

127. **Gallinago wilsoni.**—The Jack Snipe is common from the end of September till December, and thence till April becomes almost solitary; in the latter months at early dawn, after a moonlight night, a single specimen is sometimes found, on the dry pastures of salt ponds, mistaking, no doubt, for water the glittering appearance caused by the moonlight on patches of parched, low grass. In some years they are abundant, in others scarce; for the last two or three years, 1861, 1862, 1863, they have been the latter in the south midland plains, but have been abundant in the highlands. When they first arrive they lie in considerable numbers along the borders of ponds, or margins of marshy lands, in every part of the island. Many years ago, early in October, in company with the late Captain St. John, then Island Engineer, we shot more than seventy brace in three days over a small Guinea cornfield of about six acres; the land had been previously burnt off, and the corn was then only a few inches high; the water from the then recent heavy rains lying in the intervals and in puddles about the field, which adjoined woodland on two sides.

Actiturus bartramius?—The Short billed Snipe is an occasional visitor. I have a specimen shot in October, 1863, from the ridge of a house top at Reed's Pen;—the dimensions are, length 12 inches, expanse nearly 24, flexure 6½; tail, graduated, 3½; bill 1½; thigh 2¼; leg not quite 2; middle toe with claws ¼ of an inch, hind toe small. Bill dark brown, lower mandible yellow, except at the point; legs greenish yellow; upper plumage dark brown, feathers edged with tawny, lower part of the back and rump without the edging; central tail feathers same as the upper plumage; side feathers tawny, with blackish transverse bars, and irregular subterminal blotches; chin and stripe over the eye white; throat with blackish marblings, under parts yellowish white, clearer on the belly; breast and sides with transverse bars of brownish black; wing quills blackish brown, banded on the inner webs with dull white; shaft of the first quill white, under wing coverts white, with narrow bands of brownish black.

Mr. Gosse gives *Tringoides macularius* as found on the island.

126. GAMBETTA MELANOLEUCA.—The Tell-tale.

125. " FLAVIPES.—The Yellow-shanks.

122, 123. EREUNETES PETRIFICATUS. (*E. pusillus.*)—The Sandpiper.—These three Snipes are also annual visitors, arriving in considerable numbers in the autumn, but I have not met with any during the summer.

120. NUMENIUS LONGIROSTRIS.—The brown Curlew is often found in pairs among the mangrove swamps on the coast during the entire year, but more frequently on the small sandy kays to the west of Healthshire and near Old Harbour, where is also the common haunts of the two species of the Ibis. They breed in the reeds, rushes and tall marsh grass on the borders of the creeks and swamps; the eggs are four, larger at one end and obtusely pointed at the other, measuring 2 7/16 by 1 11/16; they are greenish or olive green, with blotches and splashes of dark umber and greenish brown.*

There is another bird found in the mountains, which I take to be a Curlew; it is much smaller than the preceding, and has a short bill; the upper plumage is also darker, and the under parts rusty white. It is prevalent in the north eastern parishes, about the mountain streams. (Perhaps *N. borealis.*)

In November, 1826, I had a specimen of a Woodcock, shot on the racecourse near Spanish Town, but I have not since met with it. It was supposed to be *Philohela minor.* I have only a slight recollection, and the following note of it:—Length not quite 12 inches; wing rounded; bill straight, enlarged at the end; general color pale rufous, shaded ashy and darker rufous.

RALLIDÆ.

The Coot, in common with the two Gallinules, is found abundant in the lagoons, marshes and ponds in all parts of the island, highlands as well as lowlands; particularly where there is a thick growth of reeds, rushes and water plants to afford them cover. The nidification of the three is very similar; a platform of sticks, filled in and lined with decaying leaves, rushes, water grass (*ceratophyllum*) and other water weeds, constructed in the tall reeds and vegetable growth on the margin of the water. In the lagoons the platform is often built on the interwoven roots of the black mangrove, and composed principally of the decaying pods of the same tree; they breed twice and probably oftener in the year, commencing in March; the eggs of all vary considerably in size, but are pretty regular in form and measure, from 2 to 2¼, by 1⅜ to 1⅝ of an inch. (The flesh of all makes excellent game soup, if divested of the skin, which, when left on, gives the dish a rank or fishy flavor).

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* (By Mr. Hill.) I am not sure whether the brown Curlew is not the bird that inflexes the upper bill, *Numenius*, and not *Ibis*.

140. **Fulica americana.**—The Ivory-billed Coot lays from six to eight or more eggs, oval, pointed at one end, greyish stone color, splashed all over with small bistre brown spots and dots; the ground color, when first laid, is very pale, but becomes darker by contact with the damp nest.

139. **Gallinula galeata.**—The Scarlet-fronted or Florida Gallinule lays five to eight eggs, at first clayish white, splashed sparsely with small spots of sepia brown. By contact with the damp nest, the ground color of these eggs often changes to different shades of drab. I have now, February, 1864, unfledged young of this species in a pond near Spanish Town.

210. **Gallinula martinica.**—The Purple Gallinule, Sultana or Plantain Coot, lays six to eight eggs, which are of a pale burnt sienna or yellowish drab, splashed all over with small spots and dots of burnt umbre.*

138. The **Carpenter Coot** is supposed to be the immature Plantain Coot; but I am inclined to think that, on a more careful observation, it will be found distinct; the nestlings, so far as I have been able to examine them, are quite different.

133. **Rallus elegans.**—The Mangrove, or Marsh Hen, is very common in its usual haunt in the mangrove swamps. It is considered the highest game-flavored bird in the island, and makes excellent game soup; it builds a platform of sticks, lined with softer materials, on low mangrove trees, sometimes just on the surface of the water. I have never found more than two eggs in any nest, but they are said to lay seven or eight; the eggs are clear white, measuring $1\frac{1}{8}$ by 13-16ths. †

Rallus ? violaceus.—I have often seen this species in the ferry lagoon, but never succeeded in procuring a specimen. The habits appear to be very similar to those of the preceding. In February, 1863, Mr. Colchester obtained one, a female, from the same locality. The dimensions and description given by the collector are, length $11\frac{1}{4}$ inches, expanse $15\frac{5}{8}$; bill $1\frac{3}{4}$; middle toe $1\frac{16}{16}$. The general plumage olive black, with olive brown wing coverts and spotted all over with white; iris red; bill pea green, orange at the base; legs rosy pink; gizzard muscular, and contained water snails with their shells.

134. **Rallus concolor.**—I have never found the Red Rail or Water Partridge in the salt swamps, but always near fresh water at the foot of the hills, or more commonly at the sedgy mountain ponds and streams. The eggs are white, and rather smaller than those of the Mangrove Hen.

135. **Porzana carolina.**—The common Rail is very variable in plumage; it is found at all seasons and in all waters, fresh or salt. I have never met with the eggs of this or either of the two next species.

137. **Porzana Jamaicensis.**—The Jamaica, or Little Black Rail, is also of frequent occurrence about marshy lands, and on the savannahs and open pastures in the vicinity of water. The cry of this species is chi chi-cro-croo-croo several times repeated in sharp, high-toned notes, and heard at a considerable distance.

136. **Porzana minuta.**—This little Rail is not uncommon in the savannahs and open pastures, and it has the same habits as the *P. Jamaicensis;* but I have never heard it cry. The two last build in savannahs and open pastures, forming a chamber in a tussock of grass, with galleries on opposite sides.

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* (By Mr. Hill.) The brilliancy of the plumage varies with the year, the more or less prevalence of the iridescent bronze, with the cerulean and purple, being the variation.

† This can hardly be the *Rallus elegans* of American authors, the eggs being entirely different.—S. F. Baird.

COLYMBIDÆ.

184. Podilymbus podiceps.—The Black Gorget Grebe is often met with on Rio Cobre in its entire course, and is sometimes, though rarely, seen on the Cattle Ponds in the lowlands; it, however, abounds in the highland lakes, ponds and sedgy portions of mountain streams.

I have not had the same opportunities of observing the habits of this species as I have had with the common Diver; but their general habits and nidification appear to be much alike. The nest of both species is a floating platform or mass of sticks, leaves and water weeds 15 to 20 inches wide, and the same in height, flattened at the top, with a slight depression in the middle, on which three or four oval eggs are deposited. These are chalky white, with a glaucous tinge beneath, though usually discolored by the damp materials of the nest. The dimensions are 1⅞ by 1⅜.

185. Podiceps dominicus.—The Diver frequents the ponds on the Cattle Pens, in all parts of the island. The nest is similar in construction and materials, but rather smaller than that of the Grebe. The eggs are usually four, oval, or oval-elongated, and measure 1½ to 1⅝ by rather less than an inch. This species breeds from April to December, rearing several broods. Soon after they are hatched, the young leave the nest and are carried about the pond under the wings of the parent birds, where they are securely held in swimming and diving. I once shot an old bird passing on the wing from one pond to another, and found a young bird with it, which must have been carried on its back. The same nest is used during the season, with slight additions after each brood; and is always pulled to pieces by the old birds when they have done with it.

ANATIDÆ.

Anser hyperboreus and Bernicla canadensis are occasional visitors in connection with a severe winter on the continent.

144. Dendrocygna arborea.—The Whistling Duck is a permanent resident, breeding in the lagoons and morasses on mangrove stools and in clumps of reeds and rushes, laying ten or twelve eggs. It is easily domesticated, but it is necessary to take off the first pinion of one wing to prevent it joining the passing wild flocks. They breed more than once during the year, as numbers of them are taken before they become fully fledged, and brought into the towns for sale from May to December. In 1834 and 1835, at a pen on the St. John's Road, where there is a large pond, some Whistling Ducks were kept among the domestic poultry; they frequently brought into the poultry yard, in the early dawn, small parties of the Wild Duck, which accompanied the tame ones without any shyness or alarm into the poultry house, and were thus secured. They feed by night as well as by day. Their whistling cry is often heard passing over head at night. I have frequently, on moonlight nights in January and February, shot them in numbers, whilst feeding in the guinea cornfields.

I have had the eggs from Passage Fort, but I find no note of them, and my recollection of them is too uncertain to venture upon their description.

145. Dendrocygna autumnalis.—I have been told that the Red-legged Whistling Duck is sometimes met with in some of the eastern parishes, but I have never met with any others than those imported into Kingston from the Spanish Main; and I have not seen any of these for several years.

146. Anas maxima.—The Green-back Mallard, whether a hybrid or a variety of *A. boschas*, is apparently a permanent resident in the island, almost restricted to the deep recesses of the morasses and lagoons at the west end of the island. I have never seen a specimen of this duck, but there have been

several well authenticated specimens of it, besides Gosse's and those referred to by Robinson, obtained, however, from the same vicinage.* In the summer of 1863, a nest of eleven eggs, taken from a platform of rushes floating in the large lake at Rio Hio near Walton, in the Moneague District of St. Ann's, were brought to the Rev. Mr. Mais, master of Walton School. These eggs are supposed to belong to the Mallard; they are oily white, and measure $2\frac{3}{4}$ by $1\frac{7}{8}$ of an inch.

Many years ago I saw some eggs supposed to be one of the large migratory ducks; they were taken from the lake near Dry Harbor; they were yellowish oily green, very like some eggs of the English Duck, but I could not obtain any information respecting them; they may have belonged to the Shoveller,† which I was told had been found in those waters during the same summer; or, possibly, an English Duck from Dry Harbor, or one of the neighboring pens.

148. QUERQUEDULA INORNATA.—The plain Blue-winged Teal is also a permanent inhabitant of Jamaica, breeding in the interior lagoons and morasses. It is, I think, quite distinct from *Q. discors*. During the months of May and June individuals are sometimes shot at the Cattle Ponds in the lowlands, but they come down in September in flocks of considerable numbers, and are common a month or more before the arrival of the Lunate Teal; and in no instance have I ever seen or heard of a specimen with the white crescent having been found here in the summer, or previous to the month of November. The eggs are bluish chalky white.

147. QUERQUEDULA DISCORS.—I have never seen the Lunate Blue-wing earlier than the month of November; the usual period of their arrival is towards the end of the month, and they again appear in March and April on their return to the continent, when they are usually in full summer livery.

The other species of Anatidæ which are constant in their annual visits to the island are—

159, 158. SPATULA CLYPEATA.—The Shoveller—always in considerable numbers.

155. MARECA AMERICANA.—The American Widgeon—in all its forms and variety of plumage.

164, 165. FULIX AFFINIS.—The little Black-head also comes in considerable numbers and varied forms.

153. DAFILA ACUTA.—The Pintail, in numbers and in varied plumage.

The occasional vistors are—

PÆCILONETTA BAHAMENSIS.—Ilathera Duck (rare.)

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*(NOTE by Mr. Richard Hill.)—In the October season of 1846 there had been wild, stormy rains. The winds had blown from the west with that broad, steady force which renders our tempests in the latter season as fierce as hurricanes, though not rotatory storms; prodigious numbers of ducks were blown before the winds from the continent to the islands,—that is, from the Mexican Gulf to the Carribean Sea. The birds arrived at the west end of Jamaica so exhausted and beaten by the rain that in attempting to alight they fell, and many were picked up in the streets of Montego Bay. Among several ducks that reached our garden just out of the town, was what seemed a Mallard of extraordinary size. In bulk of body it appeared as large as a Muscovy Duck, (*Cairina moschata*,) but its shape was essentially a Mallard, (*Anas boschas.*) It was taken up helpless from fatigue. Teal had been taken up at the same time in the same state of exhaustion. My sister, Mrs. Clemetson, caged the extraordinary duck, and had it for two seasons. It was a female. I saw it in the spring of 1847, and directed that it should be shipped to London for the Zoological Society. Before it could be dispatched, it died in full plumage, and full flesh. It had laid infertile eggs in the previous spring, and was again laying infertile eggs, the sexual instinct being intensely strong; and something like uterine inflammation, if we may so speak, had supervened, and the bird perished in the act of egg-laying. The duck exactly resembled in plumage Mr. Gosse's *Anas maxima*.

† Scarcely the Shoveller—eggs of which are creamy white.—S. F. B.

Aix sponsa.—The Summer Duck (very rare.)

157. Nettion Carolinensis.—The Green Wing Teal; sometimes in autumn, but generally in the spring.

156. Chaulelasmus strepeerus.—The Gadwall; sometimes abundant, but not annual.

Anas obscura.—The Dusky Duck (rare.)

263. Anas boschas.—The Mallard (rare.)

Œdemia perspicillata.—Surf Duck (very rare.)

161. Aythya americana.—The Pochard (not uncommon.)

Fulix collaris.—The Tufted Duck (rare.)

Nyroca leucopthalma.—White-eyed Duck (very rare.)

160. Aythya valisneria.—The Canvass Back is sometimes found in company with the Pintail.

The Muscovy is the species commonly kept in poultry yards, and in some localities the English Duck is also kept. The two are often crossed. The mongrels are held in higher estimation, as the young have the advantage of arriving at maturity much earlier than those of either parent, and are considered of superior flavor to either, particularly when raised on the duck ant and guinea corn.

Note by Mr. Hill.—The habitat of the Muscovy Duck is the Lake of Nicaragua. There all travellers see them at all times, either in small breeding coteries or large flocks. In the wild state their plumage is dark without any admixture of white. They were originally procured from the Mosquito shore, the country of the Muysca Indians, (see Humboldt's researches,) and hence is derived the name of Musco Duck, corrupted into Muscovy Duck. The West Indian Islanders had early naturalized them, for, on the discovery of Columbus, they speak of "ducks as large as geese," that they found among the Indians.

A critical Review of the Family PROCELLARIDÆ: Part I., embracing the PROCELLARIEÆ, or Stormy Petrels.

(Based principally on specimens in the Museum of the Smithsonian Institution.)

BY ELLIOTT COUES, M. D.

Having occasion to puhlish descriptions of several new species of Procellaridæ, which I find in the museum of the Smithsonian Institution, the present seems a fitting opportunity to embody in a review of the family the results arrived at in an investigation in which I have been for some time engaged. The present paper is the first of a series in which will be considered the entire family. It embraces the section Procellarieæ, an interesting and somewhat extensive group of which the common "Mother Carey's Chicken"—*Procellaria pelagica*—may be considered as typical. I have attempted to elucidate the specific characters of the components of the group, as well as their most natural generic disposition; and to discuss fairly such questions of synonymy as may arise. It will be perceived that in my generic arrangement, I have closely followed Prince C. L. Bonaparte, whose ideas of a genus, as set forth in his later writings, agree most nearly with my own. I have derived most assistance, as regards specific characters, from the very valuable monograph recently published by Dr. H. Schlegel, though of course it is quite impossible for me to agree with him on any points of systematic arrangement and nomenclature. A comparison of the respective monographs on this subject, by the two distinguished authors just mentioned, affords a striking illustration of the widely diverse results which may be arrived at on any investigation, when two co-workers entertain radically opposite views concerning generic or specific relations. The endeavor to harmonize such conflicting opinions is a matter of no little difficulty; but as the truth probably lies somewhere between the two, it is perhaps worth while to make the attempt. With every facility in the way of books and specimens which the Philadelphia Academy and the Smithsonian Institution afford, I may perhaps have been so fortunate as to have fixed the quite numerous species with some degree of precision, and to have settled some points of synonymy. Concerning the genera adopted, each one must judge of their agreement with nature, or the reverse, according to his own opinion upon the question of what constitutes a generic group.

The family Procellaridæ is naturally divisible into three subfamilies:—the Diomedeinæ, the Procellarinæ, and the Halodrominæ. These are readily characterizable, aside from any consideration of other features, by the position and shape of the nasal tubes. In the Diomedeinæ these tubes are entirely disconnected, and placed one on each side of the bill. In the Procellarinæ they are united, situated at the base of the culmen, and open more or less horizontally forwards. In the Halodrominæ their position is as in the Procellarinæ, but their apertures are directed vertically upwards.

The subfamily Procellarinæ is composed of several groups, or assemblages of genera and species, which constitute the "sections" of Prince Bonaparte's arrangements. These divisions are the Fulmareæ, the Daptioneæ, the Prioneæ, the Puffineæ, and the Procellarieæ. The genera composing each of these are more intimately allied to each other than they are to the genera of any other section: and we have consequently an exceedingly convenient and perhaps not unnatural means of dividing the very extensive subfamily into readily characterizable lesser groups. That section which forms the subject of the present article—the Procellarieæ—is the largest and at the same time the most marked of these groups. It may readily be distinguished from the other groups by the following peculiarities:

Section *PROCELLARIEÆ.*

The species are all uniformly of small size, there being found in this section the very smallest of natatores, and none of the species exceeding eight or nine inches in total length. In form, most of the genera are delicate and graceful, none being as robust as is usual in most of the genera of other sections. The colors of the group vary exceedingly. A large proportion of the species are fuliginous black, varied more or less with white; but in some genera there is seen some variety in the pattern of coloration. Bright colors, however, are never found. The bill is of moderate or very small size, always shorter than the head or tarsus, rather wide at the base, its sides rapidly converging towards an attenuated compressed decurved tip. The nasal tubes are long, elevated, and conspicuous; subcylindrical in shape, inclined forwards and somewhat obliquely upwards; the septum between the nares thin, delicate, and quite perpendicular; the nasal aperture circular; the tubes in length always at least nearly half as long as the culmen. The wings are long; the first primary, contrary to the general rule in this family, always shorter than the second, sometimes only as long as the fourth. The second primary is always longest, the third intermediate between the fourth and second. The primaries are acutely pointed, a little falcate, and strong, though very flexible and elastic. The tail is very long, but is exceedingly variable in shape, being even, forked, emarginate, rounded, or cuneate. The legs are exceedingly slender, delicate, compressed usually, much elongated.

The tibiæ are denuded for some portion of their length. The tarsal scutellæ are usually distinct, though fused in one genus. The toes are very long and slender, the outer nearly or quite as long as the middle, the inner considerably shorter. The hallux is exceedingly minute, almost rudimental in character, having a short, straight, acute claw. The interdigital membranes are rather narrow, but extend quite to the claws.

In examining collectively the species of the section thus characterized, we find that they arrange themselves very naturally into two very trenchantly defined groups. In the first of these, the legs are short; the tibiæ almost wholly feathered; the tarsus scarcely longer than the middle toe; the claws small, compressed and acute; the colors uniformly dark, or only relieved by white on the rump and crissum. In the second of these groups, the species all stand high, the legs being unusually elongated; the tibiæ are naked for an inch or more; the tarsi are very much longer than the middle toe and claw; the claws are all broad, depressed, obtuse, rounded. The tail is rounded or forked; never cuneate.

§. The first of these groups is composed of four genera:—*Oceanodroma* (type *Proc. furcata*, Gm.), comprehending two species; *Cymochorea*, Mihi, equal to *Thalassidroma* of authors, containing some four or five species: *Halocyptena*, Mihi, a hitherto unknown genus, with a single species; and *Procellaria* of Linnæus (as restricted by Bonaparte), whose type is the *P. pelagica*, and which comprised several species closely allied to the last named.

§§. The second group is represented by three genera:—*Oceanites* of Keyserling and Blasius, with *Thal. Wilsoni* of Bonaparte as type, and comprising besides its type three other species; *Fregetta*, Bonaparte, comprising some four species congeneric with *tropica* of Gould, and *Pelagodroma*, whose type and single species is the *Procellaria fregata* of Linnæus.

I shall review these genera and their respective species in the order in which they are mentioned above, discussing the various questions concerning which there exists doubt or confusion, and then present a synopsis of the whole subject, in accordance with the results which may be by this means arrived at.

§ I. OCEANODROMA, Reichenbach.

This genus was founded by Prof. Reichenbach upon the old *Procellaria furcata* of Gmelin. Its distinctive characters lie in its small, much compressed, rather weak bill; in its comparatively very short wings, of which the first primary is unusually abbreviated, (being intermediate between the fourth and fifth), while the third is fully as long as the second; in its very long, deeply-forked tail, with its broad central and attenuated exterior rectrices. In the proportions of the naked space of the tibiæ, and of the tarsus and toes it does not differ from several other genera of the section. The middle toe with the claw is about as long as the tarsus. The colors are peculiar, and only found in this genus.

Two species of the genus are knowm to exist; both inhabiting the North Pacific Ocean.

1. Oceanodroma furcata, Bp. ex Gmel.

This long and well known species has quite a profusion of names, generic as well as specific. First indicated by Gmelin, Syst. Nat. i. p. 561, in 1788, under the name of *Procellaria furcata*, it was renamed *Procellaria orientalis* by Pallas, Zoog. Rosso—As. ii. p. 315 (1811), and afterwards called *Thalassidroma cinerea* by Gould. It is the *Thalassidroma orientalis* of Gray, Genera of Birds, iii. 1849, pl. 178; the *Oceanodroma orientalis* of Reichenbach, Syst. Av. xviii. fig. 2445; and the *Oceandroma furcata* of Bonaparte, Conspectus Avium, ii., 1856, p. 194; which latter is, I believe, its proper desigation.

The characters of the species are too well known to require notice in this connection.

2. Oceanodroma Hornbyi, Bp. ex Gray.

This, the second species of the genus, was first introduced by G. R. Gray, in the proceedings of the Zoological Society for 1853, p. 62, under the name of *Thalassidroma Hornbyi.* Judging from Mr. Gray's descriptions—for I am autoptically unacquainted with the species—it is entirely congeneric with the *O. furcata*, though differing greatly from it in colors. This generic disposition has been made by Bonaparte, on page 195 of the second volume of his Conspectus. It appears as yet to be an exceedingly rare bird in collections: none are contained in the Philadelphia Academy or Smithsonian Institution, or, in fact, so far as I am aware, in any American collection. It has the front, cheeks, throat, collar round the neck, breast, and abdomen pure white; crown, hind head, a broad band in front of neck, bend of wing and lesser wing coverts sooty gray; upper part of back gray; lower part of back and tail ashy gray; greater wing coverts brownish gray; tertiaries and quills deep black.

"Length 8.25 inches, tail 3.75, tarsus 1.00, middle toe about the same. Bill along culmen 8½ lines, along rectus 10½ lines."

§ II. CYMOCHOREA, Coues.

This, the second genus of the short-legged acute-clawed group of Procellarieæ is most nearly allied to *Oceanodroma*, having like it a long deeply-forked tail. It is the genus of which the well known Leach's Petrel is typical; and one to which *Melania*, Bonaparte, and a new species, about to be described, also belong. With the forked tail and short legs of *Oceanodroma*, it is distinguished from that genus by its comparatively very much longer wings; by its larger, longer, much more robust bill, with shorter and straighter nasal tubules; by its radically different pattern of coloration, &c.

The name "*Thalassidroma*" is the one under which this genus is generally presented. Founded by Vigors in 1825, upon the *Procellaria pelagica*, Linnæus, the name has been employed by ornithologists, in a most unaccountably loose and vague way, to designate any and all the species of Procellarieæ, without the slightest regard to their natural generic affinities. In 1856, Bonaparte first restricted *Thalassidroma* to a single genus, that one of which *Leachii*, Temminck, is the type. But if used at all, it must be, of course, for that genus of birds upon which it was founded, viz., the one of which *pelagica* is the type; for it is contrary to all rule to use a synonym of one genus as the tenable name of another. As will be demonstrated further on, "*Thalassidroma*, Vigors," is a complete synonym of *Procellaria* proper of Linnæus, as is also *Hydrobates* of Boie, both being based upon the *P. pelagica*, Linnæus. This being the case, it is evident that the present well known genus has yet to receive a tenable distinctive appellation.

In supplying a name, I take *Leachii*, Temm., or rather *leucorrhoa*, Vieill., as my type; and in the following diagnosis so define the genus as to exclude all forms not entirely congeneric with it.

Cymochorea,* Coues. (=*Thalassidroma*, Bp. nec Vigors. Type *Procellaria leucorrhoa*, Vieill.) Bill much shorter than the head, about two-thirds the tarsus, or middle toe with the claw, rather stout, as high or higher than broad at the base, the unguis strong, much decurved; the nasal tubes less than half as long as the culmen. Wings moderately long, not much surpassing the tail when folded; first primary longer than the fourth, second longest. Tail exceedingly long, deeply forked, the feathers all broad, their tips obtusely rounded. Legs short; bare space of tibiæ brief. Tarsus equal to middle toe and claw, of rather large size, and stout form. Colors unicolor, or nearly so.

Three species are at present known to constitute this genus. These are the following:

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* Etym. from Gr. Κυμος, "wave," and *χοζος*, "a dance".

1. Cymochorea leucorrhoa, Coues ex Vieillot.

The specific characters of this, the common and abundant "Leach's Petrel," being so well known, need not detain us. Its synonymy, however, is sufficiently extensive and complicated to require attention.

There can be no doubt, I think, that the *Procellaria leucorrhoa*, Vieillot, Nouveau Dictionaire d'Histoire Naturelle, tome xxv. 1817, page 422, was based upon this species. Vieillot's description is :—" Sept pouces et demi de longueur totale ; la queue fourchue ; le bec, les pieds, les pennes alavies et caudales, noires ; la reste du plumage couleur de suie, à l'exception des couvertures superieures de la queue qui sont blanches, et d'un lisère gris-blanc qui est à l'extremité des pennes secondaires de l'aile." Our author further remarks that this Petrel " se tient sur l'ocean"—Atlantic—"jusqu'au Brésil, et peutêtre encore au delà." In every respect the description so clearly and completely applies to the present species, that no argument is needed to prove the propriety of the reference.

The next notice of the species that I have met with is by Temminck, Manuel d'ornithologie, 1820, ii. page 812, under the name of *Procellaria Leachii*. The description is pertinent and complete, and the indication of the species so unmistakeable, that the name *Leachii* has always remained the one in common employ among ornithologists.

In 1828, Dr. Fleming, in his "History of British Animals," page 136, describes this species under the name of *Procellaria Bullockii*.

The citation "*Procellaria pelagica*, Pallas nec Linnæus," is given by Bonaparte as refering to this species. From what is now known of the range of habitat of the latter, it would seem at best but a doubtful citation.

In addition to the above, the species has been placed in numerous genera. It is the *Thalassidroma Leachii* of Bonaparte, Consp. av. ii. 195 ; the *Thalassidroma Bullockii* of Selby, Ornith. ii. page 537 ; and the *Hydrobates Leachii* of Boie, Isis von Oken, 1822, p. 562.

2. Cymochorea melania, Coues ex Bonap.

This, the second species of the genus, was first introduced by Bonaparte in his Not. Orn. Delattr. in the Compt. Rend. 1854, xxviii. p. 662, under the name of *Procellaria melania*. The following is his diagnosis. "Nigro-coracina, vel in uropygio ; subtus fuliginosa ; alis longissimis ; caudâ brevi, sed profundè furcata ; tectricibus omnibus omnino nigris." Unfortunately, however, as it afterwards proved, he neglected to give any measurements ; as a consequence, the succeeding species, *homochroa*, about to be described, has appeared in the ix. vol. of the Pacific Railroad Reports as the true *melania*, when it is in reality a very different bird, though, like *melania*, it wants a white rump. Prof. Baird has been enabled to obtain from M. Pucheran the measurements of the true *melania*, and these agree perfectly with a skin in the Smithsonian from Cape St. Lucas, Lower California. As the species is yet rare in collections, and one with which comparatively few ornithologists are autoptically acquainted, a full description, taken from a typical example now before me, may not be out of place here.

Form.—The bill is large and robust, the mandibular rami of the intermaxillary especially strong and prominent. The nasal tubes, as in *T. Leachii*, measure a little less than half the length of bill. The bill is about two-thirds the length of the skull ; about half that of the tarsus. The wings are moderately long for this group, reaching only a little beyond the tail. The point of the wing is formed by the second primary alone ; the third being intermediate between the second and the first ; and the first intermediate between the third and fourth. The tail seems rather long for this group and is deeply forked, all the rectrices being quite broad to their obtusely rounded tips. The tibia is bare for a longer space than is that of *T. Leachii*. The legs are short. The tarsi are slightly longer than the middle toe and claw. The outer toe alone is absolutely longer than the middle one, but its claw is much smaller. The apex of the inner claw reaches to the base of the middle one.

Colors.—The entire plumage is of a deep sooty brownish black, deepest on the sides of the head about the eyes and on the upper parts generally, including the rump, changing gradually to a lighter, more fuliginous and more brownish black on the belly, under tail coverts and crissum. The major alar tectrices are lighter than the rest of the plumage, though not very conspicuously so. The remiges and rectrices are wholly pure black, as are the bill, feet, claws and interdigital membranes. Iris light brown.

Dimensions.—Length 9·00 inches, extent of wings 18·50 (on authority of collector's label). Bill along culmen ·60, along rictus ·95; height at base ·25, width ·25; length of nasal tubes ·30. Wing from the carpal joint 6·70. Tail—external feather 3 90, internal 2·70, depth of fork 1·20. Tibiæ bare ·50; tarsus 1·20, the middle toe and claw 1·10, (inches and hundredths.)

(Description from No. 13,025, Smithsonian Register—♂; Cape St. Lucas, Lower California. J. Xantus.)

It is somewhat a question whether this species be not the *Procellaria fuliginosa* of Latham, Ind. Orn. ii. 1790, p. 825. The following is his diagnosis: "Pr. fuliginoso-fusca, capite, collo, remigibus rectricibusque nigris cauda emarginata. * * * Habitat in insulâ Otaheite; præcedentis* magnitudine."

This description applies pretty well, but the dimensions are far too large, the preceding species—*desolata*—being described as eleven inches in length. This same "*Procellaria fuliginosa*, Lath.," is more fully described by Vieillot, Nouv. Dict. d'Hist. Nat. xxv. p. 418, (1817,) under the name of "*Petrel fuligineux* d'Otaïti." Vieillot's description, however, only applies approximately. The species is there said to be "dix pouces" long; to have the tail only "un peu fourchue;" and it is stated that the interdigital membrane "a des taches jaùnes ça et là."—In view of the uncertainty, I do not see any cause to supersede Bonaparte's name.

I am unable to discuss the relationships of a certain "*Procellaria scapulata*, Brandt," referred with a query to this species by Bonaparte.

The third species of the genus is the one already adverted to, as that one figured and described in the Birds of North America, under the name and with the synonymy of the *melania*, Bp.

3. CYMOCHOREA HOMOCHROA, Coues.

DIAG. C. *Cymochoreæ melaniæ* nec perdissimilis; sed multo minor, rostro lævi, brevi, compresso, tarso nec longiore digito medio cum ungue; plumbeo-vel schistaceo-nigra vel in uropygio crissoque; subtus sensim fuliginoso-nigra; alis caudâque fusco-nigris, tectricibus alarum majoribus dilutioribus. Long. rostri ·50; tarsi ·90; poll. aug. alæ 5·10.

Petrel not very unlike *T. melania*, but much smaller, with a short, light, much compressed bill, and the tarsus equal to the middle toe and claw. General color a dull plumbeous or slaty black, growing more or less fuliginous on the abdomen; the crissum and rump concolor with the rest of the plumage; the wings and tail dull black, the greater wing coverts light greyish brown.

Habitat. Farallone Islands, Pacific coast of North America.

Form —The bill of this species is not quite half as long as the skull, rather more than half the length of the quite short tarsus, is much compressed and not very robust. The folded wings reach a little beyond the tail. The second primary is a little the longest, the third is nearly equal, the first considerably longer than the fourth. The tail is of about the same comparative length as in *Leachii* or *melania*; the depth of the fork being as great as in the latter species.

**i e. desolata.*

† Etym. Gr. ὁμοιος, "like, same;" χροα, "color;" in reference to the uniformity of its plumage.

The tarsi are comparatively a little shorter than in this species, being no longer than the toe and claw.

Color.—The plumage, although agreeing with that of *melania* in its general characters, of its uniformity and the want of a white rump or crissum, etc., is yet quite different in tint, being of a decided plumbeous or dull deep bluish black, rather than the smoky brownish black of *melania.* Indeed the tint calls faintly to mind the plumage of *furcata.* This plumbeous tint is most palpable on the head and upper part of the back; it deepens about the eye so as to almost form an anteocular spot; and on the breast gradually changes to more of a fuliginous hue, which prevails over the whole abdomen and under tail coverts. The color of the wings and tail is not different from that which obtains with nearly all the species of the section, and there is also the same dull greyish brown band along the greater coverts, and invading the outer edges of most of the tertials, as well as their apices. A further character of the species, wherein its coloration differs from that of *melania,* is found in the inferior alar tectrices, and axillary feathers, many of which are wholly or in part dull whitish. The feet are wholly black.

Independently of any differences in plumage the following measurements, compared with those already given of the *melania,* serve at once to separate the two species:—

Dimensions.—Length (approximately correct only) 7·25 inches. Wing, from the carpal joint, 5·00 or a little more. Bill, along culmen, ·50; along rictus ·75; height at base ·21; width ·20; length of nasal tubes ·24. Tarsus ·90; middle toe and claw about the same. Tail—outer feather 3·25; inner 2·60.

Three fine specimens of this interesting species are in the Smithsonian Museum, all procured at the Farallone Islands, Pacific coast of North America. I have taken No. 21,444 as the type of my species. No. 13,725, received from Mr. F. Gruber, is the original of the figure of "*Melania,* Bp.," given in the atlas of the general report. All three are quite identical in every respect.

§ III. HALOCYPTENA,* Coues, nov. gen.

The third genus of the group is one as yet undescribed, and which I have now the pleasure of introducing to the notice of ornithologists. It differs most remarkably from all other genera of the Procellariæ in the possession of a cuneate tail. In most other respects it comes nearest to *Procellaria* proper, with *pelagica* as type; but it nevertheless differs from that genus in addition to the peculiar shape of its tail, in its exceedingly long and acute wings. The following are its diagnostic characters.

Char. Gen.—Bill much shorter than the head, about half the tarsus, weak, slender, compressed, the convexity of the culmen beyond the nostrils very great. Nasal tubes as in other Procellarieæ. Wings very long, reaching much beyond the tail, acutely pointed; second primary longest, third nearly equal, first about as long as the fourth. Tibiæ naked for a very short space. Tarsus a little longer than the middle toe or claw. Outer toe without claw, absolutely as long as the middle; but its claw very short and weak. Tip of inner claw reaching to the base of the middle one. Hallux exceedingly minute. Webs moderately full; their margins incised. Claws compressed, curved, acute. Tail rather long, wedge-shaped; the central rectrices projecting somewhat beyond the rest; the lateral all regularly graduated; the tips of all narrow, acutely rounded. Unicolor; of very small size, and exceedingly delicate form.

The only known species of the genus is the following:—

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*Etym. of name from Gr. ἁλς "ocean," ὀκυς "swift," 'πτηνος "winged;" "having the power of flight." *Halocyptena,* "the swift ocean-flyer."

1. HALOCYPTENA MICROSOMA, Coues, nov. sp.

DIAG.: *Halocyptena* rostro, pedibus, alis caudâque nigris; corpore toto intensè fusco-atro, abdomine sensim fuliginoso, tectricibus alarum majoribus dilutioribus. Long. tot. 5.75; alæ 4.75 poll. Ang. et cent.

Description.—Form typical of the genus, as above characterized. Entire plumage deep lustrous brownish black, darkest on the head, neck, back, and upper parts generally; changing gradually on the abdomen to a fuliginous brown, which is the prevailing tint of the under parts, from the breast backwards including the under tail coverts. The lesser and medium wing coverts are as dark as the back; as are also the inferior alar tectrices. The greater coverts are considerably lighter; being with the external borders of some of the tertials dull brownish, with a cast of gray. The remiges and rectrices are pure black. There is no indication of white on the rump or crissum. The bill, feet, and claws are black, as are also the interdigital membranes.

Dimensions.—Total length from tip of bill to end of tail 5.75 inches and hundredths. Wing from the carpal joint 4.75. Bill from front along culmen .48 hundredths; along rictus .62; height at base .19; width .21; length of nasal tubes .22. Bare portion of tibiæ .30; tarsus .90; middle toe and claw .82; inner do. .68; outer do. .80. Tail to end of central rectrices 2.50; to end of outer do. 2.15. Difference between central and next pair .15 hundredths.

Habitat.—South Pacific coast of North America.

Typical and unique specimen No. 11,420 of Smithsonian Museum Register. Adult female, taken in May, 1861, by John Xantus, at San José del Caba, Lower California.

This diminutive species hardly exceeds in size the little *G. pelagica*, and is at the same time much slenderer and more delicate in form than that species. The combination of the small size; peculiar form and uniform colors widely separate it from any other known Petrel.

§ IV. PROCELLARIA, Linn. emend.

The genus of which the little *pelagica* L. is the type constitutes the fifth and the last one of this short-legged group of Procellarieæ. It is readily recognizable among all its allies by the combination of its short legs, acute claws, and square or slightly rounded tail. As to size, it comprehends the very smallest of known natatores; with hardly the exception of my diminutive little *Halocyptena microsoma.* The bill is small, short compressed, the sides rapidly converging to the narrow tip; less than half as long as the skull, a little more than half the tarsus. The wings in length are typical of the section; reaching beyond the tail. The second primary is longest; the third a little shorter; the first less than the fourth. The bare proportion of the tibiæ is short; the tarsus is just equal to the middle toe and claw. The proportions of the toes to each other are as in other genera, already described. The tail is moderately long, full, the feathers broad; a little rounded in shape. In color this genus is usually dark with a white rump and crissum; though this color does not obtain throughout the genus, if such species as *nereis*, Gould, and *fasciolata*, Tschudi, really belong here.

The genus *Procellaria* first appears in 1746, in the sixth edition of the Systemæ Naturæ, having as its type the *P. pelagica*, Linnæus. Throughout successive editions the same species is invariably made typical; as it also is in the Edition of Gmelin (1788), and in Latham's Index Ornithologicus (1790). I am, therefore, quite at a loss to discover the grounds upon which modern ornithologists have been justifiable in assigning the name *Procellaria* to such a genus e. g. as that of which *glacialis*, or *antarcticus*, or *Cooki*, are respectively typical. If with Dr. Schlegel we admit but a single genus of Procellarinæ, that will of course be *Procellaria;* and we shall employ it in its original Linnean acceptation. If, however, with almost all ornithologists, we make a family Procellaridæ of Linnæus' genus *Procellaria*, and proceed to separate the component genera according to the now generally received definition of a "genus;" then *Procellaria* must be restricted to *pelagica* and its congeners, and other names be found for the remaining generic groups; there are few points of synonymy, involving a Linnean name, more clearly demonstrated than this.

The first synonym of *Procellaria* that I have met with is *Hydrobates*, Boie, Isis Von Oken, 1822, p. 562. This has *pelagica* as its type. This is not, however, to be confounded with *Hydrobata*, Vieillot, 1816, wihch is a genus of Turdidæ, with *Sturnus cinclus*, L. as type.

The second synonym of the genus is *Thallassidroma*, Vigors, Zoological Journal, Vol. ii. for October, 1825, page 405. Although based upon *pelagica*, and therefore an entire synonym of *Procellaria*, Linn., this name has become most firmly established, not only as an appellation for this genus, but also for all the Stormy Petrels indiscriminately. It will be evident, I hope, from what has just been said, that not only is the name quite untenable for the present genus, but that it cannot be used with propriety in *any* connection.

The number of species composing this genus is a little uncertain; partly in consequence of unusual variations to which *pelagica* seems subject; and partly because the indications of many comparatively recently described species are not explicit enough as regards proportions, etc., to admit of a definite reference to their proper genus. I will first notice *pelagica* and its kindred species, and then consider those species which seem to fall most naturally in this genus.

1. PROCELLARIA PELAGICA, Linnæus.

Syst. Nat. ed. vi., 1746; nec. Wils. Amer. Ornith. vii. p. 90. *Hydrobates pelagica*, Boie, Isis, 1822, p. 562. *Thallassidroma pelagica*, Vigors, Zool. Journ. ii., 1825, p. 405, et auctorum fere omnium post. A. D. MDCCCXXV. Above glossy brownish black, below more fuliginous—the under tail coverts, however, of the former color, and very long, reaching sometimes to beyond the tips of the rectrices themselves. The superior caudal tectrices are pure white, terminated, however, with equally well defined black tips. The white of the crissum is less pure and well defined; and that of the under tail coverts is much interrupted with blackish. The inferior alar tectrices and the axillary feathers are variegated with light touches of dull white.

This species apparently varies to an unusual extent in size, especially as regards length of wing. Specimens before me measure about 4½ inches from the carpal joint. Dr. Schlegel says, "aile 4 pouces à 4 pouces 6 lignes." Mr. Lawrence says "wing five inches." These variations, and doubtless corresponding discrepancies in other dimensions, have been the cause of the founding of several species; either entirely nominal, or at most constituting races of the same parent stock. Omitting entirely to notice Brehm's multifarious "species" [sic!] those most entitled to consideration are the following:—

? 2. PROCELLARIA TETHYS, Bonaparte.

Comptes Rendus, 1854, xxxviii. p. 662; et 1856, xlii. f. 769, et Consp. Av. ii., 1856, p. 197. From the Gallapagos Islands. This typical *Procellaria* is exceedingly closely allied to *pelagica*; but differs from it in wanting the black tips of the superior caudal tectrices, which are always found in the latter. It is also said to be somewhat smaller, and to have less markedly the transalar fascia.

? 3. PROCELLARIA LUGUBRIS, Natterer.

Acta Ital. Mediol., 1844. "Ex oceano Mered." This species (if it be really one), differs from the typical *pelagica* in being somewhat larger, and in having a more robust bill. It would appear also that there is less of whitish upon either surface of the wing, and upon the under tail coverts. The upper tail coverts have the same black tips. Without a typical example professing to be this species, I am unable to decide definitely concerning it, but I am much inclined to doubt its validity.

? 4. PROCELLARIA MELITENSIS, Schembri.

"*Thalassidroma melitensis*, Schembri, Catal. Ornith. del. Grupp. di Malta, p. 118." This is a species placed by Bonaparte as a synonym of a *pelagica*, but by Gray considered as distinct. I have no means of judging of its validity. The name is employed by Reichenbach to designate the true *pelagica.*

5. PROCELLARIA NEREIS, Bp. ex Gould.

Thalassidroma nereis, Gould, Proc. Zool. Soc., Lond., 1840, viii. p. 178.
Procellaria nereis, Bp. Consp. Avium, 1856, ii. p. 196.

I have had the pleasure of examining Mr. Gould's types of this species from Bass' Straits, Australia, now in the collection of the Philadelphia Academy. It is a beautiful little species, quite unlike any other known Stormy Petrel. In form it comes nearer to *Procellaria pelagica* than to any other species, and it is probably congeneric with it, though it differs somewhat in the proportions of the tarsus and toes, and very widely in its pattern of coloration.

The bill is very small, short, and compressed. The wings reach just beyond the tail; the second primary is the longest; the third and first nearly equal; the fourth much shorter. The tail is long, slightly rounded; the rectrices broad to their very tips. The tibiæ are denuded for from half to two-thirds of an inch. The proportions of the tarsus and toes differ from those of *pelagica*, in the greater comparative length of the former.

The bill, legs, and feet are black. The head all round, the upper part of the neck and the nape are fuliginous brown with a cinereous hue. This bluish ashen tint becomes the prevailing color on the lower part of the back, the wing and tail coverts, and the tertials; these feathers being edged more or less conspicuously with grayish white. The primaries are brownish black, lighter on their inner webs, the more inner ones with an ashen tinge. The caudal rectrices are light ashen blue, gradually deepening towards their tips into pure black. The entire under parts from the breast backwards, and the under surfaces of the wings, except just along their edges, are pure white. There are a few longitudinal shaft lines of bluish gray on the sides and crissum, which became still more obvious on the under tail coverts.

This species inhabits the Australian seas.

7. PROCELLARIA FASCIOLATA, Coues ex Tsch.

Thalassidroma fasciolata, Tschudi, Beiträge zur Geographischen Verbreitung der Meeresvögel in Cabanis' Journ. f. Ornith. iv., May, 1856, p. 180. From the Aurora Islands. "Sein Kopf ist schwarz, der Mantel rost braun, die untere Seite der Flügel mattschwarz, die obere wie der Mantel. Vom Rucken aber bis zur Wurzel der ersten Schwungfedern verlauft ein ½ Zoll breiter weisslich-brauner Streif. Der Bauch ist tiefschwarz, der Steiss schneweiss. Der Schwanz ist schwarz, fächerförmig, schwach halbmondförmig ausgeschweift. Schnabel und Füsse sind schwarz, die schwimmhaut sehr weit, die Iris tief schwarzbraun. An Grösse übertrifft er die *Th. pelagica* um ein Bedeutendes."

The above is the reference to and a copy of the description of a species recently introduced by Dr. Tschudi, and by him supposed to be new. If all the characters mentioned in the description really obtain, the species is certainly a valid one, for it is not at all like any known species of Stormy Petrel. My reference of it to the genus *Procellaria* is upon supposition; for the description affords not the slightest clue to its proper position. I would have preferred to have allowed it to remain under Dr. Tschudi's designation, but as *Thalassidroma* is an untenable name, I have seen fit to substitute the proper appellation of the genus. It is to be hoped that we may before long know more concerning the validity, and in that event, regarding the generic relations, of this supposed species.

??8. On the same page where *fasciolata* is described, Dr. Tschudi goes on to speak of a Petrel of which he saw several examples some degrees further south, but of which he was unable to procure specimens. The mantle was dark gray, the head blackish, the neck somewhat darker; the feet and bill black, the wing feathers blackish, the abdomen grayish white. In size it hardly equalled *pelagica.* "Ich wage daher nicht mit Bestimmtheit zu entscheiden, ob diese Vögel zu einer Species gehören, noch dem von mir beobachteten einen Namen zu gaben." A few pages further on (p. 190), the supposed species is named *Thal. dubia.* As from the circumstances of observation there is extreme liability to error, and, at all events, great uncertainty, *Thal. dubia* had better quietly await more reliable data before claiming recognition.

The remaining species constitute the second group of Procellarieæ, separable from the preceding group by exceedingly trenchant characters. In the first place, the species all *stand high*: the lengthened tarsi much exceed in dimensions the long toes, while at the same time the tibiæ are greatly elongated, and bare of feathers for the greater part of their extent. The claws are very different from those of the first section, being broader than high, depressed, not compressed, and always more or less rounded and obtuse. The tail varies, being either rounded, square or forked; but when the latter, it is never so deeply forked as in *oceanodroma*, etc., of the first group. The wings are very long, much surpassing the tail.

Three distinct genera constitute this section.

§ VI. OCEANITES, Keys. et Blas.

This is the genus of which our common "Wilson's Petrel" is the type,—first named *Oceanites* by Keyserling and Blasius Wirlbelth. Europ. ii., 1864, p. 238. It is in many respects the most distinct and remarkable genus of the Procellarieæ, being widely diverse in all its characters from all others. It may be well here to define its limits with precision.

Oceanites, Keys. et Bl. (Type Proc. *pelagica*, Wils. nec Linn.) The bill is short, weak, compressed, its sides a little concave, its tip attenuated, the convexity of the culmen along the unguis comparatively little; it is less than half as long as the head, about half as long as the middle toe without the claw, about two-fifths the tarsus. The nasal tubes, instead of rising obliquely upwards and forwards, as in the genera of the first section, have their dorsal outline perfectly straight and horizontal. The wings are exceedingly long and acute, and the proportions of the primaries different from that which obtains in any genus hitherto considered; the second primary very much the longest; the first fully equal to the third; the fourth very greatly shorter than the first. The tail is of moderate length and nearly square, being neither much forked nor much rounded, large and full, the feathers broad to their very tips. The legs are the most peculiar. The elongated tibiæ are bare for an inch or more. The very long tarsi present the remarkable feature of having their anterior and lateral aspects covered with one smooth unbroken podotheca or "boot," resulting from the fusion together of the ordinary plates and scutellæ. Posteriorly the plates remain pretty distinct. The toes, though very long, are, without the claws, only two-thirds the tarsus. The hallux is so extremely minute as to be discernible only on close inspection, when it is apparent as an exceedingly short, acute claw. The anterior claws are flattened and broad, and scarcely at all curved. The species of the genus are among the larger in size, with much the colors of *Procellaria* proper.

Of the genus as thus constituted, the following species are known to me:—

1. OCEANITES OCEANICA, (Kuhl).

Procellaria pelagica, Wils. Am. Orn., 1808, vi. p. 90, pl. lx. *Procellaria* *oceanica*, Kuhl, Beit. Zool., 1820, Monog. *Proc.* p. 136, pl. x. fig. i. *Thalassidroma oceanica*, Gray. Gen. Birds iii., 1849. *Thalassidroma Wilsoni*, Bonap., J. A. N. S., Philada. iii. 1823, p. 231, pl. ix. et auct. *Oceanites Wilsoni*, Keys et Blas. Wirbelth. Europ. ii., 1840, p. 238. *Oceanites oceanica*, ——— ? This is one of the best known and most widely distributed of the Procellarieæ. Its characters need not detain us. Some points of synonymy seem, however, to require investigation.

The first notice of the species is in 1808, when it was accurately described and figured by Wilson, as above, under the erroneous name of *Procellaria pelagica*, Linn. This error was first noticed and corrected by Bonaparte in the Journal of the Philadelphia Academy for 1823, and the species named *Thalassidroma Wilsoni*. This is the appellation by which it has been most usually known to ornithologists.

In the year 1820 there appeared in Kuhl's Beiträge Zur Zoologie, in the article entitled "Beiträge zur Kenntniss der Procellarien," a description accompanied with a figure of the head, of the present species, under the name of "*Procellaria oceanica* Banks." The figure is poor, and difficult to recognize, but the full description is pertinent in every respect, and unequivocally refers to the present species. This name should consequently receive that precedence over *Wilsoni* to which its priority clearly entitles. Indeed, Bonaparte himself, in his Conspectus Generum Avium, p. 199, and also in his Conspectus Gaviærum in the Comptes Rendus for April 28, 1856, admits that the two names refer to the same species.

The only question appears to be this:—Banks had, before the appearance of Kuhl's Monograph, applied the name *oceanica* to specimens of this species from the Southern Oceans. This Australian form Bonaparte considers as a variety of the Atlantic bird, in the fasciculus of his Conspectus bearing date of Jan. 1st, 1856; and shortly afterwards, in the Comptes Rendus for April 28, 1856, he accords to it full specific rank. If the Australian form be really a distinct species, then, of course, it would bear Bank's and Kuhl's name of *oceanica*, and *Wilsoni* could be retained for the Atlantic species. Such, however, I am confident, is not the case. I have carefully examined specimens of the species from Australia (among them the types of Mr. Gould's work, "The Bird's of Australia"), and I have failed to detect the slightest differences which could even mark the southern bird as a distinct variety. They appear to me absolutely identical, as indeed they are considered by the majority of writers. Such being the case, then, "*Wilsoni*, Bp.," must become a synonym of *oceanica*, Kuhl, and the species be known as *Oceanites oceanica*.

2. OCEANITES LINEATA, Bonap. ex Peale.

Thalassidroma lineata, Peale, Ornith. U. S. Expl. Exped. *Oceanites lineata*, Bonaparte, Consp. av. ii. 1856, p. 200.—Several good examples of this well marked species are in the Smithsonian Museum, being those collected by Mr. Peale himself. It is very different in most of its characters from the preceding species. It is a much larger bird. The wing measures 6½ inches from the flexure, the tail a little more than 3 inches. The tarsus is 1⅜ inches long; the middle toe and claw 1¼. The bill is larger and stouter, though of the same relative proportions. The tarsi, however, absolutely but little if any longer, and are, therefore, relatively shorter, as *lineata* is a larger bird. The general pattern of coloration is the same as in *oceanica*; but *lineata* may be readily distinguished by the white streaks which variegate the under surface of the body and wings. On the anterior portions of the belly, the black and white are in about equal amount, but more posteriorly and on the crissum, under wing and tail coverts, the white is by far the predominating color. The black appears only along the centre of each feather as a shaft line, producing an appearance which renders the name "*lineata*" exceedingly pertinent. This species wants the yellow spaces on the interdigital membranes, so conspicuous in *oceanica*. The most important difference in form between the two species lies in the much greater flatness and obtuseness of the claws of *lineata*.

With the following two species I am autoptically unacquainted, and can only judge of their specific validity, and of their generic relations, from the descriptions of their authors. They evidently, however, belong to the long-legged, depressed-clawed group of Stormy Petrel, and I think there can be little or no doubt that they both are species of *Oceanites*. Such indeed is certainly the case with the *Thal. segethi* of Phillippi and Landbeck,[*] the description of which is so complete and perfect in every respect, that I have no difficulty in assigning it to its proper genus.—Would that all birds could be as thoroughly described on their first introductlon to ornithologists! The *Thal. gracilis*, Elliot, seems so closely allied to both *lineata* and *segethi*, that it can hardly but be an *Oceanites*; though I cannot speak concerning it with the same degree of certainty as I do regarding the former species.

3. OCEANITES SEGETHI, Coues. ex Ph. et Ldbk.

Thalassidroma segethi, Phillippi and Landbeck, Wiegmann's Archiv, 1860, p. 282.—The following description of this species is condensed from the one originally given by its discoverers:

The bill and feet are glossy black. The head, neck, back, throat and breast, as well as the upper wing coverts, dark blackish gray, the latter, however, tending somewhat towards brownish. Wing and tail feathers deep black. The feathers of the upper parts have white borders, which, however, are worn away in the course of the summer. The inner web of the four outer tail feathers is white at the base. The upper tail coverts, the abdomen, the flanks, and the circumanal region are white. Under tail coverts are black, with white bases and tips. The lesser inferior wing coverts, and the whole border of the wings are black, the rest of the inferior coverts white.

Length 7½ inches (French). Bill 6 lines; tail 2 inches 11 lines; wing 5¼ inches. Tarsus 1 inch 5 lines; middle toe 10 lines. Naked portion of the tibiæ 7 lines: Wings when folded reaching an inch beyond the tail.

Habitat.—The coast of Chili.

This species is compared by its describers with the *lineata* as follows: "It comes nearest to the species described by Titian Peale, in the United States Exploring Expedition, which was found breeding on the Island of Upolu. This species agrees with ours in size, in the form of the feet, and in the colors generally, but differ from it in this respect, that, while in *lineata* the feathers of the neck are white with black tips, and those of the breast, belly and flanks are white in the middle and black at the tips, in *segethi* the feathers of the neck and breast are uniformly slatey black, and those of the abdomen and flanks are entirely white; moreover, in *segethi* the outermost of the superior tail coverts are wholly white, while in *lineata* they have black shaft lines."

This species, however, requires very careful comparison with the succeeding, before its claims to specific distinction can be fully substantiated. I do not hesitate to express my decided opinion, that they will be found to be identical; for, so far as I can judge of the colors from the descriptions, they are quite similar, and certain descrepancies in the measurements of the two may result from the difference between the French and English inch. The habitat of the two birds is precisely the same; still, in view of some points, in the descriptions which do not entirely accord, and especially because it seems useless to exchange one doubtful opinion for another, I have preferred to consider both species as valid, until an opportunity be afforded of determining the question with certainty.

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[*] These authors themselves remark (p. 284) "on account of the long legs, and the much abbreviated hallux, our bird should be referred to Bonaparte's new genus *Oceanites*; but it appears that a generic separation can hardly be made with propriety upon such inconsiderable differences." May I be allowed to ask, with propriety, if shape of bill, peculiar proportions of tarsus and toes, length of wings and tail, and above all, the fusion of the tarsal plates can be accounted as "inconsiderable differences?"

4. OCEANITES GRACILIS, Coues ex Elliot.

Thalassidroma gracilis, D. G. Elliot, Sclater's Ibis, 1859, p. 391.—"Plumage sooty black. Quill feathers brown. Secondary coverts margined with light brown. Rump, upper tail coverts and middle of abdomen, white. Tail black, the two outer feathers with a white mark on the lower half of the inner web, growing narrower as it descends; lower half of the shafts white, the rest black. Under tail coverts white margined with black. Breast sooty. Bill black. Tarsi and feet very long and slender, black. Length 5·90 inches; wing 5·22; tail 2·40; bill ·40; tarsus 1·20."

Habitat.—Coast of Chili.

In general characters this species seems closely allied to *Oceanites lineata*, and the pattern of coloration is, in many respects, very similar. The dimensions of the bird, however, will at once separate it from that species; for the wing is more than half an inch shorter, the tail fully as much less, and the bill, tarsus and toes are proportionally as much smaller in dimensions. As already remarked, it comes much nearer to the *O. segethi*, and is very possibly the same bird. In the event of this proving to be the case, *gracilis*, Elliot, has priority over *segethi*, Ph. et L., and must be retained as the name of the species.

§ VII. FREGETTA, Bp.

This well marked genus, as limited by its author, Bonaparte, contains several species, all more or less closely allied to each other, and agreeing in the possession of the following generic characters: The bill is small and short, measuring in length hardly half that of the skull; about as high as broad at the base, the sides converging rapidly toward a somewhat compressed, attenuated and decurved tip. The nasal tubes are stout, short and elevated towards their extremities. The culmen and commissure are both much decurved. The wings are rather elongated, reaching a little beyond the tail; the second primary is longest, the third nearly equal; the first generally between the third and fourth. The tail is long, nearly square, but sometimes more or less emarginate; the rectrices all exceedingly broad to their very tips, which are subtruncated. The legs are long and stout; the tibiæ naked for a considerable space; the tarsi much exceed in length the toes, which latter are very short, unusually stout, and connected by rather narrow webs. The species are all of rather large size, and stout form, and are bicolor, the dark and light colors occupying distinct areas. The type of the genus is the *Thalassidroma tropica*, Gould, which, with the other species, chiefly inhabit the intertropical and southern seas.

The genus is so well marked as to require special comparison with no other. The following are the species composing it with which I am acquainted:

1. FREGETTA TROPICA, Bp. ex Gould.

First described by Gould, Ann. et Magaz. Nat. Hist. vol. xiii. p. 366, under the name of *Thalassidroma tropica*, this species is referred to its proper genus by Bonaparte, in his Conspectus Generum Avium, p. 197, and also in his Conspectus Gaviarium, p. 797 of the Comptes Rendus for 1856. If there be other synonyms of the species, I have not met with them.

It is the largest species of the genus, measuring 8·75 to 9·00 inches in length. The tail is more forked than in the other representatives of the genus, the depth of the emargination being ¾ of an inch. The bill measures a little more than ⅓ the length of the tarsus and it is rather stout, especially at the base, where it is broader than high. The tarsus varies from 1⅔ to 1¾ of an inch in length; the middle toe with its claw 1¼ inches, or a little more.

The plumage is fuliginous black; the lower part of the breast, the belly, the sides under the wings, both tail coverts, the throat, and a nuchal collar, white.

The species inhabits the intertropical portions of both the Atlantic and Pacific Oceans.

In the shape of the bill, emargination of the tail, length of wing, and peculiar proportions of the tarsus and toes, this species differs somewhat from the other representatives of the genus *Fregetta*, as here adopted,—so much so, that ornithologists may perhaps hereafter find it expedient to restrict the genus to this single type, and present the remaining species under a different generic appellation.

2. FREGETTA GRALLARIA, Bp. ex Vieillot.

This long known species has, in spite of its well marked characters, been presented under so numerous and diverse designations, that its synonymy requires careful consideration.

The first unequivocal indication of this species that I have met with is that given by Vieillot, on page 418 of vol. xxvi of the Nouveau Dictionnaire, (1817,) under the name of "Le pétrel échasse, *Procellaria grallaria*." The accompanying description, though brief, is entirely pertinent to the present species; and Vieillot's name is, therefore, entitled to priority over subsequent designations.

Prof. Lichtenstein has, in the Catalogue of the Duplicates of the Berlin Museum, page 83, (1823), conferred the name *grallaria* upon a different species, viz:—the *melanogastra* of Gould.

In 1820 the species was presented by Kuhl, Monogr. Proc., p. 138, pl. x. fig. 3, under the name of "*Procellaria fregatta*, Banks." This author's description is very full and quite accurate, but he erroneously adduces the name "*P. æquorea*" as a synonym, whereas the latter really is a synonym of quite another species, viz:—the *Procellaria marina* of Latham.

Bonaparte acknowledges, in his Conspectus, p. 198, the error he committed in 1828, of referring to this species under the name of *Thalassidroma oceanica*, he having in his synopsis of the Birds of North America confounded Vieillot's *grallaria* with the *Oceanites oceanica* of this paper.

Finally, in the Annals and Magazine of Natural History, Mr. Gould describes this species as new under the name of *Thalassidroma leucogastra*.

A fine suite of specimens are before me, among which are some of Mr. Gould's typical examples, received by the Philadelphia Academy from him. They vary more than is usual among the *Procellaria*, in the color of the upper parts, which ranges from a deep fuliginous brownish black to a much lighter plumbeous or ashen hue. Some—the lightest colored ones—have all the dorsal feathers edged with greyish white. The circumocular region is usually the darkest colored. The white of the under parts varies exceedingly in extent; it sometimes reaches far up on the throat, including nearly all the under surface of the bird; while in other examples it is nearly as much restricted, that is to say, descends as low on the breast as is usual in examples of *melanogastra*. The lightest colored birds are apparently the most immature.

The bill is stout, nearly as high as broad at the base, measuring from the front to apex, about half the length of the skull. The nasal tubes are long and elevated. The wings are moderately long, reaching just beyond the very slightly emarginate tail. The second primary is longest; the third nearly equal; the first intermediate between the third and fourth. The rectrices are exceedingly broad to their very tips, which are subtruncated. The tibiæ are denuded for the space of one inch. The tarsus measures 1·50 to 1·60 inches, the middle toe and claw 1·05 to 1·10. The wing from the flexure measures 6⅓ inches.

The species inhabits the tropical portions of both oceans.

3. FREGETTA MELANOGASTRA, Bp. ex Gould.

Thalassidroma melanogastra, Gould, Ann. et Mag. Nat. Hist., xiii. p. 367.

I have had an opportunity of examining Mr. Gould's typical specimens of this species, now in the collection of the Philadelphia Academy. Although it is very closely allied to the preceding, both in form and colors, yet it constantly differs as follows: While a somewhat smaller bird, it has yet considerably longer tarsi and toes; the bill is longer, slenderer, with a more attenuated and gradually decurved unguis. The wing is nearly an inch shorter; the proportions of the primaries about the same as in *grallaria*. The tail is about a third of an inch less. With the same general distribution of colors as in *grallaria*, this species differs in the presence of a central longitudinal brownish black streak, which divides the white of the abdomen into two symmetrical lateral halves. This ray is not always perfect, being sometimes only indicated by a few disconnected, black feathers. I have never, however, in a large number of specimens seen it entirely wanting, but even if this be ever the case, the species may be readily diagnosed by its peculiarities of size and form above detailed.

The species inhabits the tropical regions of the Pacific Ocean.

This is, in all probability, the species indicated by Forster, Descriptiones Animalium, Edit. Lichtenstein, 1844, p. 180, under the name of "*Procellaria fregata*, Linn.;" at least, I judge this to be the case (although no mention is made of the ventral ray) from the annexed foot-note, by Prof. Lichtenstein, in which the latter says that it is upon this species (*fregata*, Forst.) he has based his *Procellaria grallaria*, (Cat. Dupl. Berl. Mus. p. 83) which is "ob longitudinem pedum segreganda." This length of the feet is exactly the most patent point of difference in form of this species from the preceding.

4. FREGETTA LAWRENCII, Bp. ex Lawr.

Thallassidroma fregetta, Lawrence, Annals of the New York Lyceum of Natural History, 1851, p. 117.—*Fregetta Lawrencii*, Bonaparte, Conspectus Avium. ii. p. 198.

It is exceedingly to be regretted that the typical and only known specimen of this species has been lost, so that there is no opportunity of comparing it with *leucogastra*, to which it is so very closely allied. I can, therefore, do no more than simply present Mr. Lawrence's description, from which ornithologists must judge for themselves regarding its specific validity.

"Head and wings black; neck, breast and back dark plumbeous, or dull bluish ash; wing coverts brown; the tail white at the base, with the terminal half and the two central feathers black; abdomen, inside of wings and rump, white; bill and legs black. Tail even; claws flattened and of an ovate form. Length about 8 inches; wing 6; tail 3; tarsus 1⅜. (Gen. Rep. Birds N. A., p. 832).

§ VII. PELAGODROMA, Reichenbach.

A very peculiar genus of Procellarieæ, readily recognizable by the following characters:—

Bill very long, but little less than the head, exceedingly slender, much compressed, higher than broad at the base, the nasal tubes very short, less than half the culmen, the unguis attenuated only slightly and very gradually decurved. Wings of moderate length, reaching just beyond the tail; second primary longest, third nearly equal, first about equal to the fourth. Tail very long, nearly square or but slightly emarginated, the feathers all exceedingly broad to their truncated apices. Legs very long, somewhat stout, only moderately compressed. Tibiæ denuded for an inch or more. Tarsus of ordinary length for this group; toes all unusually long, the middle with its claw being but little less than the tarsus. Interdigital membranes all very full and broad. Of large size, rather stout form, and variegated colors.

This genus agrees with *Fregetta* in many respects, but differs markedly from it in the length, straightness and attenuation of the bill; and in the very unusually long toes, with their broad, full, interdigital membranes. The pattern of coloration is very dissimilar from that of most of the species of *Fregetta* or indeed of any other genus of Procellarieæ.

The long and well known *Procellaria fregetta* of Linnæus is its typical and only species.

1. PELAGODROMA FREGATA, Bp. ex Linn.*

The history of the synonymy of this species is somewhat involved, since, as demonstrated in the annexed foot-note, the *Procellaria fregata* of Linnæus has been very variously interpreted by different writers. Some authors have considered it as referring to the *tropica* of Gould, others to the *grallaria* of Vieillot, others again to the *melanogastra* of Gould; while one author has applied the name to a new species, afterwards dedicated to him by Bonaparte, (*Fregetta Lawrencii.*) But I entirely agree with Prof. Lichenstein, (foot-note on page 180 of Forster's "Descriptiones Animalium") and with Bonaparte (Conspectus, p. 198) that the *Proc. fregata*, Linn., was based upon the bird first described by Barrere, and which Latham subsequently more definitely characterized as *Procellaria marina.* With this view of the case, the following is an exposition of the synonymy of the species in question:

Proc. fregata Linnæus, S. N. i. 1766, (nec Forster, nec Kuhl., nec Lawrence.) *Procellaria marina*, Latham, Ind. Ornith. ii. 1790, et Kuhl, Monog. Proc. 1823, p. 138, pl. x, fig. 2. *Thalassidroma marina*, Gray, Genera Birds, iii. 1849. *Pelagodroma marina*, Reichenbach, Syst. Av. *Pelagodroma fregata*, Bp., Consp. Av. ii. 1856, p. 198. *Procellaria æquorea*, Solander. *Procellaria hypoleuca*, Webb et Berth., Av. Canar.

This large and beautiful species, so peculiar both in form and colors, is too well known to require any description in this connection.

There is in the Philadelphia Academy a very young individual of this species which has not yet wholly emerged from the downy state of plumage. Yet, although so very immature, the peculiar color and markings of the adults are already entirely apparent. This is ample evidence that the birds of this group are subject to no changes of plumage of any consequence in their progress towards maturity. I have fortunately been able to extend the same observation to other species. A fledgling of *Cymochorea leucorrhoa*, now before me, has exactly the pattern of coloration of the adults, and the uropygial white is already discernable, the only difference being that the black is rather of a slaty than of a fuliginous tint. The chief variations of plumage to which, at least, the fuliginous species are subject, will all be found, I think, to depend upon season. After the moults, when the feathers are fresh and new, they are much darker, and more uniformly so, than after they have become old and worn. Their tips then assume a somewhat lighter brown color, and the dull brown alar fascia, common to so many of the species, becomes much more conspicuous. This is readily demonstrable by examining any of the fuliginous species during the moult, when the old and new feathers will be found to be quite different in the precise shade of the fuliginous brown.

The preceding pages contain notices of all the known species of Procellarieæ with which I am acquainted, as well as references to and criticisms upon the more or less doubtfully valid ones. I have purposely, however, omitted all consideration of the *Procellaria Bulweri* of Jardine and Selby in this connection, because I cannot regard it as belonging to this group at all. This species—the *Thalassidroma Bulweri* of some authors—the *Puffinus columbinus*, Webb et Berth—the *Procellaria anjinko*, Heine—is by Bonaparte made the type of a genus *Bulweria*, which its author places among the Procellarieæ. But I assert most confidently that the bird in question is not a "Stormy Petrel" at all, but a species of the section Fulmareæ, closely allied to, and entirely congeneric with, the *P. atlantica*, Gould, and the *P. aterrima*, Verreaux, which compose Bonaparte's genus *Pterodroma*. The most constant and uniformly diagnostic character of the Stormy Petrels proper is found in the shortness of the first primary, compared with the second and third, and in a certain peculiar flexibility and elasticity of all the remiges. The *P. Bulweri* has none of these characteristics. The general contour of the bill, and especially the size and shape of the nasal tubes are very different from what obtains throughout the Procellarieæ; while the feet and tail disagree to a scarcely less marked extent. The fact of its small size seems to me no argument for its introduction into this section, for it is scarcely smaller than several species of Puffineæ, e. g., *nugax*, Solander, or *yelknan*, Acerbi. In my mind there is no doubt that Dr. Schlegel has correctly indicated its affinities in placing it in intimate connection with the *Pterodroma aterrima*, Verreaux, and *atlantica*, Gould.

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* Among the Procellarieæ no name has been so indiscriminately used by authors for so many different species as "*fregata*, Linn.," variously spelled *fregata*, *fregatta*, *fregetta*, etc. That this may occur less frequently in future, and for convenience of reference, the following synoptical view of the various applications of the word is given:

Proc. FREGATA, *Linn.*=*P. æquorea*, Soland.=*P. hypoleuca*, Webb. et Berth.=*P. marina*, Lath.=*Thal. marina*, Gray.=*Pelagodroma marina*, Reich.=*Pelagodroma* FREGATA, Bp. ex L., of this paper.

Proc. FREGATA, *Forster.*=*P. grallaria* Licht. nec Vieill.=(probably) *Thal. melanogastra*, Gould,=*Fregetta melanogastra*, Bp. ex Gould, of this paper.

Proc. FREGATTA, *Kuhl.*=*P. grallaria*, Vieill.=*Thal. oceanica*, Bon. (1828).=*Thal. leucogastra*, Gould.=*Fregetta grallaria*, Bp. ex Vieill., of this paper.

Thal. FREGETTA, *Lawr.*=*Fregetta Lawrencii*, Bp. ex Lawr., of this paper.

The following is a brief synopsis of the genera and species of the section, prepared according to the views expressed in the preceding pages. It is made as brief as is consistent with perspicuity, only the more important features being presented.

Synopsis of the genera and species of the Procellarieæ.

Family *PROCELLARIDÆ*:—The Petrels.

Chs. Longipennine natatores, with tubular nostrils, and free, imperfect, or rudimentary halluces.

Subfamily *PROCELLARINEÆ*:—The True Petrels.

Chs. Nasal tubes united, placed on the culmen, opening horizontally forwards.

Section *PROCELLARIEÆ*:—The Stormy Petrels.

Chs. Nasal tubes long, elevated, the nostrils separated by a thin partition. Bill shorter than the head. Wings long, the second primary always longer than the first; all the primaries elastic and flexible. Tail very variable in shape, always long. Legs and feet more or less elongated, always slender and compressed. Tibiæ more or less denuded of feathers. Tarsi as long or longer than the middle toe and claw. Outer toe nearly as long as the middle. Hallux minute. Of small size, and very slender form.

Group A. Legs short (for this section). Tarsus but little, if any, exceeding the middle toe and claw. Tibiæ denuded for but a short space. Claws compressed, acute. Generally of dark and nearly uniform colors.

I. Tail forked.

1. Genus Oceanodroma, Reich. Bill small, weak, compressed. Third primary nearly as long as the second; first intermediate between fourth and fifth; colors variegated.

O. furcata, Bp. ex Gmel. (*P. furcata*, Gm. *P. orientalis*, Pall. *Thal. cinerea*, Gould. *Thal. furcata*, Gray, et Auct. *Oceanod. orientalis*, Reich. *O. furcata*, Bp). Bluish gray, lighter beneath, passing into black around the eyes and on the primaries.

O. Hornbyi, Bp. ex Gray. (*Thal. Hornbyi*, Gray). Ashen gray, passing into blackish on the wings; with the front, cheeks, a nuchal collar, and the under parts generally, white.

2. Genus CYMOCHOREA, Coues. (= *Thalassidroma*, Auct. sed non Vig.) Bill comparatively large and strong. Wings much longer than in preceding genus; second primary much the longest; first longer than fourth. Colors uniform or nearly so.

C. leucorrhoa, Coues ex Vieill. (*Proc. leucorrhoa*, Vieill. *Thal. Leachii*, Temm. et Auct.) Fuliginous, with a white rump and crissum.

C. melania, Coues ex Bp. (*Thal. melania*, Bp. nec Lawr.) Entirely fuliginous brownish black. Total length about 9.00 inches; wing 6.75; tail 3.90; bill .60; tarsus 1.20.

C. homochroa, Coues. (*Thal. melania*, Lawr. nec Bp.) Entirely brownish black, with a cinereous tinge. Length about 7.25 inches; wing 5.00; tail 3.25; bill .50; tarsus .90.

II. Tail cuneate.

3. Genus HALOCYPTENA, Coues, nov. gen. Bill about half the tarsus. Wings exceedingly long; second primary longest; third nearly equal; fourth about equal to first. Tail very long.

H. microsoma, Coues, nov. sp. Smallest known Petrel. Entirely fuliginous black. Length 5.75 inches; wing 4.75! tail 2.50; bill .48; tarsus .90; middle toe and claw .82.

III. Tail square, or slightly rounded.

4. Genus PROCELLARIA, Linn. [Emend.] (*Thalassidroma*, Vig.) Bill very small and short, robust; wings and tail moderately long; third primary nearly equal to the second; first shorter than fourth. Middle toe a little less than tarsus.

P. pelagica, L. nec Wils. (*Hydrobates pelagica*, Boie. *Thalassidroma pelagica*, Vigors et auct.) The white upper tail coverts tipped with black.

?. *P. tethys*, Bp. The upper tail coverts entirely white.

?. *P. lugubris*, Natterer. Somewhat larger, with a more robust bill.

?. *P. melitensis*, (Schembri).

P. nereis, Bp. ex Gould. (*Thal. nereis*, Gould.) Head, neck, upper part of back, fuliginous brown with a cinereous hue, which, on the back, wing, and tail coverts, lightens into a clear bluish ash. Primaries brownish black; tail feathers light ashen blue, deepening into black towards their tips. Beneath white, with some bluish shaft lines.

P. fasciolata, Coues ex Tschudi. (*Thal. fasciolata*, Tsch.) Bill, feet, head, slightly rouunded tail, and underparts to the vent black. Circumanal region pure white; the back rusty brown, as are the superior surfaces of the wings. A whitish brown streak from the back to the bases of the primaries half an inch broad.

Group B. Legs extremely long and slender. Tarsus much. exceeding the middle toe and claw. Tibiæ naked for a great portion of their length. Claws depressed, obtuse, rounded. More or less variegated in colors.

I. Tail slightly rounded. Tarsal scutella fused together.

VI. Genus OCEANITES, Keys et Blas. Bill small and weak. Nasal tubes perfectly horizontal. Wing exceedingly long; second primary much the longest; first fully equal to the third; fourth much shorter. Toes very long, but only two-thirds the tarsus. Hallux exeedingly minute.

Oceanites oceanica, (Kuhl). *Proc. pelagica*, Wils. nec Linn. *P. oceanica*, Kuhl et Banks. *Thal. oceanica*, Gray. *Thal. Wilsoni*, Bp. olim. *Oceanites Wilsoni*, Keys et Blas.; Bp. quoque, nuper. *Oceanites oceanica* ——— ?)

Fuliginous brownish black, the rump and crissum white, the interdigital membranes mostly yellow.

Oceanites lineata, Bp. ex Peale. (*Thal. lineata*, Peale.) Much larger than *O. oceanica;* the colors generally similar; but the entire abdomen streaked with black and white. Interdigital membranes wholly black. Wing 6.50; tarsus 1.40.

Oceanites Segethi, Coues ex Ph. et Ldbk. (*Thal. Segethi*, Ph. et Ldbk.) With the form and general colors of *O. lineata;* but the feathers of the neck and breast uniformly slaty black, and those of the abdomen and crissum entirely white, as are also the upper tail coverts, including the outermost row.

Oceanites gracilis, Coues ex Elliott. (*Thalassidroma gracilis*, Elliot.) Much smaller than *lineata;* "wing 5.22; tarsus 1.20." Sooty black; the rump, upper tail coverts, and middle of abdomen white. Secondary coverts margined with light brown. Tail black; two outer feathers partially white.

II. Tail more or less emarginate, sometimes nearly even. Tarsal scuttellæ distinct.

A. Toes exceedingly short and stout; their webs small and narrow.

VII. Genus **Fregetta**, Bp. Bill small, short, stout at the base. Third primary nearly equal to second, first longer than fourth. Fuliginous and white in color.

F. tropica, Bp. ex Gould. (*Thalassidroma tropica*, Gould.) Very large, nearly nine inches in length; the tail more deeply forked than in other species of the genus (¾ inch). Fuliginous black; the abdomen, sides, under surface of wings, throat and a nuchal collar white.

F. grallaria, Bp. ex Vieillot. (Non *grallaria*, Licht. *Proc. fregatta*, Kuhl, nec Linn. *Thal. leucogastra*, Gould. *Thal. oceanica* (*!*) Bp. olim.) Deep grayish, darkening on the wings and tail into brownish black. Middle of belly, sides, and tail coverts white. Wing 6.25 inches from the carpal joint.

F. melanogastra, Bp. ex Gould. (*? Proc. fregata*, Forst. nec Linn. *P. grallaria*, Licht, nec Vieill. *Thal. melanogastra*, Gould. *Proc. melanogastra*, Schlegel. Rather smaller, but with slenderer and longer bill and feet; and the white of the abdomen divided by a longitudinal black line.

F. Lawrencii, Bp, ex Lawr. (*Thal. fregetta*, Lawr. nec auct.) From the South Atlantic coast of North America. Length about eight inches. Wing 6.00. Tail white at the base; its terminal half and the whole of the median rectrices black.

B. Toes exceedingly long and slender, their webs broad and full.

VIII. Genus **Pelagodroma**, Reich. Bill unusually long, weak, and compressed; the nasal tubes short, obliquely elevated. Proportions of primaries about as in *Fregetta.* Tail very long, scarcely emarginate, the rectrices exceedingly broad to their truncated tips.

Pelagodroma fregata, Bp. ex Linn. (*Proc. fregata*, Linn. sed nec auct. quæ plerumque ad species varias generis Fregettæ spectant. *Proc. marina*, Lath. *Thal. marina*, Gray. *Pelagodroma marina*, Reich. *Proc. æquorea*, Soland. *Proc. hypoleuca*, Webb et Berth.) Interdigital membranes yellow. General color grayish ashy, deepening into blackish on the wings and tail. Under parts with the front and a superciliary ray white.

The present paper will be followed as soon as possible by a similar review of the section Puffineæ.

April 5th.

Mr. Cassin in the Chair.

Eight members present.

April 12th.

DR. BRIDGES, Vice-President, in the Chair.

Twenty-two members present.

The following were presented for publication:

"Descriptions of six new species of Unionidæ from Lake Nyassa, Central Africa;" "Descriptions of six new species of Succinea," and "Descriptions of thirteen new species of Melanidæ." By Isaac Lea.

"A Critical Review of the Procellaridæ, Pt. II." By E. Coues, M. D.

The death was announced of Samuel Ashmead and William J. Taylor, late members of the Academy.

April 19th.

DR. BRIDGES, Vice-President, in the Chair.

Eighteen members present.

The following were presented for publication:

"Description of a new species of Planorbis;" "Descriptions of five new species of Lymnæa;" "Description of two new species of Unionidæ from South Africa," and "Descriptions of twenty-four new species of Physa." By Isaac Lea.

"Notes of an examination of the Birds of the Group Cœrebrinæ," etc. By John Cassin.

April 25th.

DR. BRIDGES, Vice-President, in the Chair.

Nineteen members present.

The following, on favorable report of the respective committees, were ordered to be published:—

Synonymy of the Species of STREPOMATIDÆ, a Family of Fluviatile Mollusca inhabiting North America.

Part 3.

BY GEORGE W. TRYON, JR.

Genus SCHIZOSTOMA, Lea.

Schizostoma, Lea, Philos. Proc. ii. p. 242, Dec. 1842, iv. p. 167, Aug. 1845. Philos. Trans. x. p. 67, 1847. Obs. iv. p. 41, 1847. Proc. Acad. Nat. Sci., May, 1860. Jour. Acad. Nat. Sci. v. pt. 3, p. 245, Mar., 1863. Obs. ix. p. 67.

Schizocheilus, Lea, Philos. Trans. x. p. 295, 1853. Obs. v. p. 51, 1853.

Gyrotoma, Shuttleworth, Mittheil, Naturforsch. Bern. p. 88, July 22, 1845. Adams, Genera, i. p. 305, Feb., 1854. Gray, Guide to Mollusca, i. p. 103, 1857. Chenu, Man. de Conchyl. i. p. 293, 1859. Anthony, Proc. Acad. Nat. Sci., p. 63, Feb., 1860. Binney, Check List, June, 1860. Brot, List, p. 27, 1862.

Melatoma, Anthony, Gray, Zool. Proc., p. 153, 1847. Woodward, Manual, p. 131, 1851. Reeve, Conch. Icon., Mar., 1860.
Apella, Mighels, MSS.

SYNOPTICAL TABLE OF SPECIES.*

Fissure direct, narrow, and deep.	*Fissure oblique, short, and wide.*
1. Shell striate or ridged.	
a. *Shell conical, spire lengthened, sharply carinate.*	
1. S. Cariniferum, Anthony.	15. S. pagodum, Lea.
S. Showalterii, Lea.	16. S. pyramidatum, Shutt.
2. S. castaneum, Lea.	17. S. Wetumpkaense, Lea.
	S. ornata, Anth.
	S. pagoda, Lea, of Reeve.
b. *Shell conic-cylindrical; spire obtuse, not carinate.*	
3. S. ovoideum, Shuttleworth.	18. S. Alabamense, Lea.
	19. S. Anthonyi, Lea.
4. S. excisum, Lea.	20. S. babylonicum, Lea.
	Spillmanii, Lea.
c. *Shell globosely-ovate, spire moderate.*	
5. S. pumilum, Lea.	21. S. Buddii, Lea.
Globosum, Lea.	*S. funiculatum*, Lea.
Alabamense, Lea, of Reeve.	*S. pagodum*, Lea, of Reeve.
Showalterii, Lea, of Reeve.	
2. Shell smooth.	
d. *Shell elliptic.*	
6. S. ellipticum, Anthony.	
7. S. laciniatum, Lea.	
e. *Shell quadrately cylindrical.*	
8. S. amplum, Anthony.	22. S. demissum, Anth.
9. S. nuculum, Anthony.	*S. Hartmanii*, Lea.
	23. S. constrictum, Lea.
	S. rectum, Anth.
10. S. cylindraceum, Mighels.	24. S. salebrosum, Anth.
	S. robustum, Anth.
	S. rectum, Anth., of Reeve.
f. *Shell ovate, whorls obliquely flattened, spire obtuse.*	
11. S. bulbosum, Anthony.	25. S. glandulum, Lea.
S. ovalis, Anthony.	26. S. incisum, Lea.
12. S. curtum, Mighels.†	*S. virens*, Lea.
	S. quadratum, Anthony.
	S. obliquum, Anthony.
13. S. glans, Lea.	
g. *Shell globose.*	
14. S. sphæricum, Anthony.	

SPECIES.

1. S. cariniferum, Anthony.

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* The *Schizostomæ* contain two nearly equal groups, characterized respectively by a narrow direct, and an oblique, short, wide slit.

In the above table the opposite species in the two groups are generally exactly similar except in the character of the slit!

† Synonym of *bulbosum?*

Gyrotoma carinifera, Anthony, Proc. Acad. Nat. Sci., p. 66, Feb., 1860. Binney, Check List, No. 310. Brot, List, p. 27,
Melatoma cariniferum, Anthony, Reeve, Monog. Melatoma, t. 2, f. 13.
Schizostoma Showalterii,[*] Lea, Proc. Acad. Nat. Sci., p. 93, Mar., 1860. Jour. Acad. Nat. Sci., t. 35, f. 49, Mar., 1863. Obs. ix. p. 68.
Gyrotoma Showalterii, Lea, Binney, Check List, No. 334. Brot, List, p. 28.

2. S. castaneum, Lea.
Schizostoma castaneum, Lea, Proc. Acad. Nat. Sci., p. 186, May, 1860. Jour. Acad. Nat. Sci., v. pt. 3, t. 35, f. 50. Obs. ix. p. 69.
Gyrotoma castanea, Lea, Binney, Check List, No. 311. Brot, List, p. 27.

3. S. ovoideum, Shuttleworth.
Gyrotoma ovoideum, Shuttleworth, Mittheil., Bern. Nat. Gesell., No. 50, p. 88, July 22, 1845. H. & A. Adams, Genera, iii. t. 32, f. 4.

4. S. excisum, Lea.[†]
Melania excisa, Lea, Philos. Proc., p. 242, Dec., 1842. Philos. Trans. ix. 1846. Jay, Cat., 4th edit., p. 273.
Schizostoma excisa, Lea, Wheatley, Cat. Shells U. S. p. 28.
Gyrotoma excisa, Lea, Binney, Check List, No. 317. Brot, List, p. 27.
Melatoma excisum, Lea, Reeve, Monog. sp. 2.

5. S. pumilum, Lea.
Schizostoma pumilum, Lea, Proc. Acad. Nat. Sci., p. 187, May, 1860. Jour. Acad. Nat. Sci., v. pt. 3, t. 35, f. 57, Mar., 1863. Obs. ix. p. 74.
Gyrotoma pumila, Lea, Binney, Check List, No. 328. Brot, List, p. 27.
Schizostoma globosum,[‡] Lea, Proc. Acad. Nat. Sci., p. 187, May, 1860. Jour. Acad. Nat. Sci., v. pt. 3, t. 35, f. 58, Mar., 1863. Obs. ix. p. 74.
Gyrotoma globosa, Lea, Binney, Check List, No. 321. Brot, List, p. 27.
Melatoma globosum, Lea, Reeve, Monog. t. 3, f. 18.
Melatoma Alabamense, Lea, of Reeve, Monog. sp. 20.
Melatoma Showalterii, Lea, of Reeve, Monog. sp. 23?

6. S. ellipticum, Lea.[§]
Melatoma ellipticum, Anthony, MSS. Reeve, Monog., t. 3, f. 21, Apr. 1861.
Gyrotoma elliptica, Anthony, Brot, List, p. 27.

7. S. laciniatum, Lea.
Schizostoma laciniatum, Lea, Philos. Proc. iv. p. 167, Aug., 1845. Philos. Trans. x. p. 69, t. 9, f. 57, 1853.
Gyrotoma laciniata, Lea, Binney, Check List, No. 324. Brot, List, p. 27.

8. S. amplum, Anthony.
Gyrotoma ampla, Anthony, Proc. Acad. Nat. Sci., p. 66, Feb., 1860. Binney, Check List, No. 306. Brot, List, p. 27.
Melatoma amplum, Anthony, Reeve, Monog. t. 3, sp. 16.

9. S. nuculum, Anthony.
Melatoma nucula, Anthony, MSS. Reeve, Monog. t. 3, f. 19, Apr., 1861.
Gyrotoma nucula, Anthony, Brot, List, p. 27.

10. S. cylindraceum,[‖] Mighels.
Schizostoma cylindracea, Mighels, Bost. Proc. i. p. 189, Oct., 1844.

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[*] Mr. Reeve's figure 23 of *Melatoma Showalterii* does not represent this species, but *S. pumilum*, Lea.

[†] Mr. Reeve and Dr. Brot, place *ovoideum*, Shutt., in the synonymy of this species. As I have no means of comparing specimens of the latter with Mr. Lea's species, I have preferred to separate them at present. *S. Babylonicum* is a larger, wider, more robust species.

[‡] The young of *pumilum*.

[§] Distinguished from *bulbosum*, Anth., by its more lengthened form, and by the regularly convex outline of the body whorl and spire.

[‖] I have not seen this species.

Gyrotoma cylindracea, Müll.,[*] Binney, Check List, No. 315.
Gyrotoma cylindracea, Gould, Brot, List, p. 27.

11. S. bulbosum,[†] Anthony.
Gyrotoma bulbosa, Anthony, Proc. Acad. Nat. Sci., p. 65, Feb., 1860. Binney, Check List, No. 309. Brot, List, p. 27.
Melatoma bulbosum, Anthony, Reeve, Monog. sp. 22.
Gyrotoma ovalis, Anthony, Proc. Acad. Nat. Sci., p. 65, Feb., 1860. Binney, Check List, No. 325. Brot, List, p. 27.

12. S. curtum,[‡] Mighels.
Schizostoma curta, Mighels, Bost. Proc. i. p. 189, Oct., 1844.
Gyrotoma curta, Mighels, Binney, Check List, No. 314.
Gyrotoma curta, Gould, Brot, List, p. 27.

13. S. glans,[§] Lea.
Schizostoma glans, Lea, Proc. Acad. Nat. Sci., p. 186, May, 1860. Jour. Acad. Nat. Sci., v. pt. 3, t. 35, f. 52, Mar., 1863. Obs. ix. p. 70.
Gyrotoma glans, Lea, Binney, Check List, No. 320. Brot, List, p. 27.

14. S. sphæricum, Anthony.
Melatoma sphæricum, Anthony, MSS., Reeve, Monog. sp. 8, Apr., 1861.

15. S. pagoda,[||] Lea.
Schizostoma pagoda, Lea, Philos. Proc. iv. p. 167, Aug., 1845. Philos. Trans., x. p. 67, t. 9, f. 52, 1853.
Gyrotoma pagoda, Lea, Chenu, Manuel, i. f. 2020. Binney, Check List, No. 327. Brot, List, p. 27.

16. S. pyramidatum,[¶] Shuttleworth.
Gyrotoma pyramidatum, Shuttleworth, Mitt. Bern. Nat. Gesell., No. 50, p. 88, July 22, 1845. Binney, Check List, No. 329. Brot, List, p. 27.

17. S. Wetumpkaense, Lea.
Schizostoma Wetumpkaense, Lea, Proc. Acad. Nat. Sci., p. 187, May, 1860. Jour. Acad. Nat. Sci., v. pt. 3, t. 35, f. 56, Mar., 1863. Obs. ix. p. 73.
Gyrotoma Wetumpkaensis, Lea, Binney, Check List, No. 336. Brot, List, p. 28.
Melatoma Wetumpkaense, Lea, Reeve, Monog. t. 3, f. 17.
Melatoma ornata,[**] Anthony, MSS., Reeve, Monog. fig. 11.
Melatoma pagoda, Lea, Reeve, Monog. fig. 1, a. (not 1 b).

18. S. Alabamense,[††] Lea.
Schizostoma Alabamense, Lea, Proc. Acad. Nat. Sci., p. 187, May, 1860. Jour. Acad. Nat. Sci., v. pt. 3, t. 35, f. 54. Obs. ix. p. 72.
Gyrotoma Alabamensis, Lea, Binney, Check List, No. 305. Brot, List, No. 27.

19. S. Anthonyi, Reeve.

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[*] Typographical error.

[†] Having examined many specimens of *bulbosum* and *ovalis*, I find no difference of specific weight.

[‡] I have not seen this species.

[§] More inflated, heavier, much lighter in color, not so strongly striated, and with narrower bands than *S. globosum*, Anth. In a very fine specimen before me, the body whorl is disposed to be tuberculate below the suture.

[||] Mr. Reeve figures two distinct species for this shell; his fig. 1 a. is *S. Wetumpkaense*, Lea, and fig. 1 b. is *S. Buddii*, Lea.

[¶] I have seen no authentic specimens of this species.

[**] Never published by Mr. Anthony, who sent a specimen with label attached, marked "Proc. A. N. S.," to Mr. Reeve. Mr. Reeve, misled by this reference, refers in his description to *Anc. ornata*, Anthony, and consequently assigns North Carolina as the habitat. No species of *Schizostoma* is known to exist out of Coosa River, Alabama. *S. ornata* is the young of *Wetumpkaense*.

[††] Mr. Reeve's figure 20, intended for this species, I refer to *S. babylonicum*, Lea. *Alabamense* is distinguished from *babylonicum* by the regularity of its striæ.

Melatoma Anthonyi, Reeve, Monog. sp. 12, Apr., 1861.

Gyrotoma Anthonyi, Reeve, Brot, List, p. 27.

20. S. babylonicum, Lea.

Schizostoma babylonicum, Lea, Philos. Proc., iv. p. 167, Aug., 1845. Philos. Trans. x. p. 68, t. 9, f. 54.

Gyrotoma babylonicum, Lea, Binney, Check List, No. 307. Chenu, Manuel de Conchyl. i. f. 2021. Brot, List, p. 27.

? *Melatoma babylonicum*, Lea, Reeve, Monog. sp. 6.

Schizostoma Spillmanii, Lea, Proc. Acad. Nat. Sci., p. 54, Feb., 1861. Jour. Acad. Nat. Sci., v. pt. 3, t. 35, f. 55. Obs. ix. p. 72.

21. S. Buddii, Lea.[*]

Schizostoma Buddii, Lea, Philos. Proc. iv. p. 167, Aug., 1845. Philos. Trans. x. p. 68, t. 9, f. 53.

Gyrotoma Buddii, Lea, Binney, Check List, No. 308. Brot, List, p. 27.

Schizostoma funiculatum, Lea, Philos. Proc., iv. p. 167, Aug., 1845. Philos. Trans. x. p. 69, t. 9, f. 56.

Gyrotoma funiculata, Lea, Binney, Check List, No. 318. Brot, List, p. 27.

Melatoma funiculatum,[†] Lea, of Reeve, Monog., sp. 5.

Melatoma pagoda, Lea, of Reeve, Monog., sp. 1, b.

22. S. demissum,[‡] Anthony.

Gyrotoma demissa, Anthony, Proc. Acad. Nat. Sci., p. 64, Feb., 1860. Binney, Check List, No. 316. Brot, List, p. 27.

Melatoma demissum, Anthony, Reeve, Monog., sp. 9.

Schizostoma Hartmanii, Lea, Proc. Acad. Nat. Sci., p. 187, May, 1860. Jour. Acad. Nat. Sci., v. pt. 3, t. 35, f. 51. Obs. ix. p. 69.

Gyrotoma Hartmanii, Lea, Binney, Check List, No. 322. Brot, List, p. 27.

23. S. constrictum,[§] Lea.

Schizostoma constrictum, Lea, Philos. Proc., iv. p. 167, Aug., 1845. Philos. Trans., x. p. 68, t. 9, f. 55.

Gyrotoma constricta, Lea, Binney, Check List, No. 302. Brot, List, p. 27.

Gyrotoma recta, Anthony, Proc. Acad. Nat. Sci., p. 64, Feb. 1860. Binney, Check List, No. 331. Brot, List, p. 27.

Melatoma rectum, Anthony, Reeve, Monog. sp. 10, not sp. 7, a.

24. S. salebrosum,[||] Anthony.

Gyrotoma salebrosa, Anthony, Proc. Acad. Nat. Sci., p. 66, Feb., 1860. Binney, Check List, No. 333.

Melatoma salebrosum, Anthony, Reeve, Monog. sp. 8 and 15.

Gyrotoma robusta, Anthony, Proc. Acad. Nat. Sci., p. 67, Feb., 1860. Binney, Check List, No. 332. Brot, List, p. 28.

Melatoma robustum, Anthony, Reeve, Monog. sp. 14, a, b.

Melatoma rectum, Anthony, of Reeve, Monog. sp. 7, a.

25. S. glandula,[¶] Lea.

Schizostoma glandula, Lea, Proc. Acad. Nat. Sci., p. 187, 1860. Jour. Acad. Nat. Sci., v. pt. 3, t. 35, f. 53, Mar., 1863. Obs. ix. p. 71.

Gyrotoma glandula, Lea, Binney, Check List, No. 319. Brot, List, p. 27.

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[*] Mr. Reeve's figure (3) of this speecies is a *Goniobasis læta*, Jay.

[†] This figure does not so well represent *funiculatum* as fig. 1, b, intended for *S. pagoda*.

[‡] Mr. Lea, (Jour. Acad. Nat. Sci., v. pt. 3), makes this species to equal his *S. constrictum*. I do not consider them the same; *constrictum* is longer and narrower.

[§] Mr. Reeve's figure 7, a, represents rather a smooth variety of *salebrosum*, Anth.

[||] In a large number of specimens before me, the distinctive features of *salebrosum* and *robustum* become so completely and insensibly merged together that I cannot separate them, and believe them to be identical.

[¶] Closely allied to *S. incisum*, but may be distinguished by being heavier, of different color, higher spire, and more convex outline.

26. S. incisum,* Lea.
Anculosa (*Schizostoma*) *incisa*, Lea, Philos. Proc., ii. p. 243, Dec., 1842. Philos. Trans. ix. p. ——.
Schizostoma incisa, Lea, Wheatley, Cat. Shells, U. S. p. 28. Hanley, Conch. Misc. Melania, t. 5, f. 44, 45.
Gyrotoma incisa, Lea, Binney, Check List, No. 323. Brot, List, p. 27.
Melatoma incisum, Lea, Reeve, Monog. sp. 4.
Melania incisa, Lea, Jay, Cat., 4th Edit., p. 274.
Leptoxis incisa, Lea, Binney, Check List, No. 363. Haldeman, Monog. p. 2, t. 1, f. 24—26.
Gyrotoma quadrata, Anthony, Proc. Acad. Nat. Sci., p. 65, Feb., 1860. Binney, Check List, No. 330.
Melatoma quadratum, Anthony, Reeve, Monog. fig. 7, b, (not 7 a, or 8).
Schizostoma virens, Lea, Proc. Acad. Nat. Sci., p. 187, 1860. Jour. Acad. Nat. Sci., v. pt. 3, t. 35, f. 59. Obs. ix. p. 75.
Gyrotoma virens, Lea, Binney, Check List, No. 335. Brot, List, p. 28.
Gyrotoma obliqua, Anthony, MSS.

Species unknown to me.

Gyrotoma conica, Shuttleworth, (ubi) Brot, List, p. 27.

3d Section: aperture entire and rounded below.

Genus ANCULOSA, Say.

Anculosa, Say, Jour. Acad. Nat. Sci., ii. p. 178, Nov. 1821. Conrad, Am. Jour. Sci. xxv. p. 342, 1834. Muller, Syn. Test. Viv. p. 39, 1836. Swainson, Manual Malacol. 1840. Haldeman, Suppl. to Monog. Limniades, Oct. 1840. Sowerby, Conch. Manual, Edit. 2, p. 66, 1842. Wheatley, Cat. Shells U. S. p. 27, 1845. Lea, Philos. Trans. ix. p. 14, 1846. Anthony, Proc. Acad. Nat. Sci. p. 67, Feb. 1860.
Anculosa, Conrad, Hermannson Indices Gener. Malac. i. p. 51, 1846.
Anculotus, Say, Jour. Acad. Nat. Sci., v. pt. 1, p. 128, Aug. 1825. Conrad, New Fresh Water Shells, p. 62, 1834. Couthuoy, Bost. Jour. ii. p. 184, Feb. 1839. Anthony, Bost. Jour., iii. p. 278, Jan. 1840. DeKay, Moll. N. York, p. 101, 1843. Chenu, Bibl. Conch. i. iii. Conrad, p. 26, 1845. Gray, Genera, Zool. Proc. xv. p. 153, 1847. Woodward, Manual, i. p. 131, 1851. Jay, Cat. 4th Edit., p. 276, 1852. Reeve, Conch. Iconica, Sept. 1860.
Ancylotus, Say, Hermannson, Indices. Gen. Mal. i. p. 51, 1846.
??*Leptoxis*, Rafinesque, Journ. de Phys. lxxxviii. p. 424, 1819. Haldeman, Monog. Lept. H. & A. Adams, Genera, i. p. 307, Feb. 1854. Chenu, Man. de Conchyl. i. p. 294, 1859. Binney, Check List, p. 10, June, 1860. Brot, List, p. 23, 1862.
Mudalia, Haldeman, Suppl. to Monog. Limn., Oct. 1840.
Nitocris, H. & A. Adams, Genera, i. p. 308, Feb. 1854.

1. *Nodulous species.*

1. A. Anthonyi, Budd.
Anculosa Anthonyi, Budd, Redfield, Ann. Lyc. N. Hist., vi. p. 130, t. 1, f. 6, Apr., 1854.
Leptoxis Anthonyi, (Budd) Redfield, Brot, List, p. 23. Binney, Check List, No. 341.
Anculotus Anthonyi, (Budd) Redfield, Reeve, Monog. Anc. t. 2, f. 17.

2. A. plicata, Conrad.
Anculotus plicatus, Conrad, New Fresh water Shells, p. 61, t. 8, f. 18, 1834.

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* Mr. Lea, (Obs. ix. p. 67), considers *quadratum*, Anth., to be a synonym of his *S. incisum*, in which decision I entirely agree with him. To these I unite *S. virens*, Lea, which I find to be the young shell of the same species.

DeKay, Moll. N. York, p. 103. Jay, Catalogue, 4th Edit., p. 276. Reeve, Monog. t. 3, f. 22.

Anculosa plicata, Conrad, Wheatley, Cat. Shells U. S., p. 28.

Leptoxis plicata, Conrad, Binney, Check List, No. 379. Haldeman, Monog. Lept., p. 3, t. 2, f. 35—39.

Anculosa bella, Lea, Philos. Proc., ii. p. 83, Oct., 1841. Wheatley, Cat. Shells U. S., p. 28.

Anculosa tuberculata, Lea, Philos. Proc., ii. p. 83, Oct., 1841. Phil. Trans., ix. p. 21. Obs., iv. p. 21. Wheatley, Cat. Shells U. S., p. 28. Binney, Check List, No. 392.

Anculotus Smaragdinus, Reeve, Monog. t. 3, f. 23, Apr., 1860.

2. *Sulcate species.*

3. A. Showalterii, Lea.

Anculosa Showalterii, Lea, Proc. Acad. Nat. Sci., p. 93, 1860. Jour. Acad. Nat. Sci., 2d Ser., v. pt. 3, p. 255, t. 35, f. 62, Mar., 1863. Obs., ix. p. 77, t. 35, f. 62.

Leptoxis Showalterii, Lea, Binney, Check List, No. 385. Brot, List, p. 25.

Anculotus sulcosus, Anthony, MSS., Reeve, Monog. Anculotus, t. 6, f. 44, Apr., 1861.

Leptoxis sulcosa, Anthony, Brot, List, p. 26.

4. A. canalifera, Anthony.

Anculosa canalifera, Anthony, Proc. Acad. Nat. Sci., p. 68, Feb., 1860.

Anculotus canaliferus, Anthony, Reeve, Monog. Anculotus, t. 5, f. 39.

Leptoxis canalifera, Anthony, Binney, Check List, No. 345. Brot, List, p. 24.

3. *Striate species.*

5. A. littorina, Haldeman.

Anculosa littorina, Haldeman, Spec. Number of Monog. Cover of No. 1, Monog., July, 1840.

Leptoxis littorina, Haldeman, Monog. Lept., p. 4, t. 4, f. 110. Binney, Check List, No. 368. Brot. List, p. 24.

Melania pilula, Lea, Philos. Proc., ii. p. 15, Feb., 1841. Philos. Trans., viii. p. 186, t. 6, f. 50. Obs., iii. p. 24, t. 6, f. 50. DeKay, Moll. N. York, p. 99. Troost, Cat. Moll. Tennessee. Wheatley, Cat. Shells U. S., p. 26. Binney, Check List, No. 204. Catlow, Conch. Nomenc., p. 188.

6. A. costata,* Anthony.

Anculotus costatus, Anthony, Bost. Jour. Nat. Hist., iii. p. 278, t. 3, f. 1, Jan., 1840. DeKay, Moll. N. York, p. 102, t. 7, f. 139. Reeve, Monog. Anculotus, t. 5, f. 41.

Anculosa costata, Anthony, List of Shells of Cincinnati, 2d Edit. Wheatley, Cat. Shells U. S., p. 28.

Leptoxis costata, Anthony, Binney, Check List, No. 349.

Melania occidentalis, Lea, Philos, Proc., ii. p. 12, Feb., 1841. Philos. Trans., viii. p. 172, t. 5, f. 20. Obs., iii. p. 10, t. 5, f. 20. DeKay, Moll. N. Y., p. 95. Wheatley, Cat. Shells U. S., p. 26. Jay, Cat., 4th Edit., p. 274. Binney, Check List, No. 184. Catlow, Conchologist's Nomenc., p. 188.

7. A. rubiginosa, Lea.

Anculosa rubiginosa, Lea, ii. p. 83, Oct., 1841. Philos. Trans., ix. p. 20. Obs., iv. p. 20.

Anculotus rubiginosus, Lea, Jay, Cat., 4th Edit., p. 276. Reeve, Monog. Ancul., t. 2, f. 12, t. 6, f. 47.

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* *M. occidentalis*, Lea, is the mature form, and *costata* the young, of this species. They are not identical with *trilineata*, Say, as supposed by Prof. Haldeman. The latter species is not found in the upper Ohio, where *costata* abounds.

Leptoxis rubiginosa, Lea, Haldeman, Monog. Lept., f. 59 to 70. Binney, Check List, No. 383. Chenu, Manuel, i. f. 2035, 2036.

Anculosa Griffithiana, Lea, Philos. Proc., ii. p. 83, Oct., 1841. Philos. Trans., ix. p. 20. Obs., iv. p. 20. Wheatley, Cat. Shells U. S., p. 28.

Anculotus Griffithsianus, Lea, Reeve, Monog. Anculotus, t. 1, f. 8.

Leptoxis Griffithiana, Lea, Binney, Check List, No. 362.

4. *Angulated species.*

8. A. dissimilis, Say.

Paludina dissimilis, Say, Nicholson's Encyc., 3d Am. Edit., 1819.

Anculotus dissimilis, Say, Ravenel, Cat., p. 11. Jay, Cat., 4th Edit., p. 276. Reeve, Monog. Ancul. t. 4, f. 27.

Anculosa dissimilis, Say, Wheatley, Cat. Shells U. S., p. 28. Haldeman, in Ruppell's Lancaster County, p. 479.

Leptoxis dissimilis, Say, Haldeman, Monog. Lept., p. 4, t. 4, f. 85—100. Brot, List, p. 24. Binney, Check List, No. 355.

Helix subcarinata, Wood, Index, Test. Lister, t. 111, f. 5.

Anculotus carinatus, DeKay, Moll. N. Y., p. 101, 1843. Jay, Cat., 4th Edit., p. 276.

Anculosa carinata, DeKay, Wheatley, Cat. Shells U. S., p. 28.

Leptoxis carinata, DeKay, Binney, Check List, No. 343. Brot, List, p. 24.

Variety a.

Anculosa carinata, Lea, Proc. Philos., ii. p. 34, Apr., 1841. Philos. Trans., ix. p. 15. Obs. iv. p. 15.

Leptoxis carinata, Lea, Binney, Check List, No. 344.

Anculosa, variabilis, Lea, Philos. Proc. ii. p. 34, Apr. 1841. Philos. Trans. ix. p. 15. Obs. iv. p. 15. Wheatley, Cat. Shells U. S. p. 28.

Leptoxis variabilis, Lea, Chenu, Manuel, i. f. 2037—39. Binney, Check List, No. 394. Brot, List, p. 26. Haldeman, Monog. Leptoxis, p. 4, t. 4, f. 102—9.

Variety b.

Anculotus nigrescens, Conrad, New Fresh Water Shells, p. 64, t. 8, f. 17, 1834. DeKay, Moll. N. Y., p. 102. Wheatley, Cat. Shells U. S. p. 28. Jay, Cat., 4th Edit. p. 276.

Leptoxis nigrescens, Conrad, Binney, Check List, No. 372.

Anculotus trivittatus, DeKay, Moll. N. Y., p. 102, t. 7, f. 137, 1843.

Leptoxis trivittata, DeKay, Binney, Check List, No. 390.

Variety c.

Anculotus monodontoides, Conrad, New Fresh-Water Shells, p. 61, t. 8, f. 16, 1834. DeKay, Moll. N. Y., p. 102. Jay, Cat., 4th Edit., p. 276. Wheatley, Cat. Shells U. S., p. 28. Reeve, Monog. Anc. t. 5, f. 37.

Mudalia monodontoides, Conrad, Chenu, Manuel, i. f. 2046—8.

Leptoxis monodontoides, Conrad, Haldeman. Monog. Leptoxis, p. 5, t. 4, 5 f. 124—133. Binney Check List, No. 370.

Anculotus dentatus, Couthuoy, Am. Journ. Sci. xxxvi. p. 390, July, 1839. Bost. Journ. Nat. Hist. ii. p. 185, t. 4, f. 7, Feb. 1839. Reeve, Monog. Anc. t. 5, f. 36. DeKay, Moll. N. Y., p. 102. Jay, Cat., 3d Edit., p. 63.

Anculosa dentata, Couthuoy, Wheatley, Cat. Shells U. S., p. 28.

Leptoxis dentata, Couthuoy, Binney, Check List, No. 352.

Anculosa dentata, Lea, Philos Proc. ii. p. 34, Apr. 1841.

Leptoxis dentata, Lea, Binney, Check List, No. 353.

Anculosa (*Mudalia*) *affinis*, Haldeman, Monog. Limniades, Cover of No. 3, Mar. 13th, 1841.

Anculotus affinis, Haldeman, Reeve, Monog. Anculotus, t. 6, f. 53.

Leptoxis affinis, Haldeman, Binney, Check List, No. 337. Brot, List, p. 23.

9. A. dilatata,* Conrad.
Melania dilatata, Conrad, New Fresh-Water Shells, Appendix, p. 6, t. 9, f. 5, 1834.
Anculotus dilatatus, Conrad, Reeve, Monog. Anculotus, t. 5, f. 38.
Anculosa dilatata, Conrad, Am. Journ. Science, n. s., i. p. 407. Hanley, Conch. Misc. t. 5, f. 38.
Mudalia dilatata, Conrad, Chenu, Manuel de Conchyl. i. f. 2043—5.
Leptoxis dilatata, Conrad, Haldeman, Monog. Leptoxis, p. 4, t. 4, f. 111—120. Binney, Check List, No. 354. Brot, List, p. 24.
Melania Rogersii,† Conrad, New Fresh-Water Shells, Appendix, p. 7, t. 9, f. 7, 1834. Jay, Cat., 4th Edit., p. 274.
Anculotus Rogersii, Conrad, Reeve, Monog. Anculotus, t. 4, f. 28.
Leptoxis Rogersii, Conrad, Binney, Check List, No. 382.
Anculotus carinatus, Anthony, Bost. Journ. Nat. Hist., iii. pt. 3, p. 394, t. 3, f. 5, July, 1840. Reeve, Monog. Anculotus, t. 5, f. 42.
Leptoxis carinata, Anthony, Binney, Check List, No. 342.
Anculotus Kirtlandianus, Anthony, Bost. Journ. Nat. Hist., iii. pt. 3, p. 295, t. 3, f. 4, July, 1840. Jay, Cat., 4th Edit., p. 276. Reeve, Monog. Anculotus, t. 4, f. 29.
Anculosa Kirtlandiana, Haldeman, Wheatley, Cat. Shells U. S., p. 28.
Melania inflata, Lea, Philos. Trans. vi. p. 17, t. 23, f. 98. Obs. ii. p. 17. Wheatley, Cat. Shells U. S., p. 25. Binney, Check List, No. 147.
Leptoxis rapæformis, Haldeman, Monog. Leptoxis, p. 4, t. 4, f. 123. Brot, List, p. 25.

10. A. corpulenta,‡ Anthony.
Anculosa corpulenta, Anthony, Proc. Acad. Nat. Sci. p. 68, Feb. 1860.
Anculotus corpulentus, Anthony, Reeve, Monog. Anculotus, t. 1, f. 9.
Leptoxis corpulenta, Anthony, Binney, Check List, No. 348. Brot, List, p. 24.

11. A. melanoides, Conrad.
Anculotus melanoides, Conrad, New Fresh-Water Shells, p. 64, t. 8, f. 19, 1834. DeKay, Moll. N. Y., p. 102. Wheatley, Cat. Shells U. S., p. 26, Reeve, Monog. Anculotus, t. 6, f. 48.
Leptoxis melanoides, Conrad, Haldeman, Monog. Leptoxis, p. 5, t. 5, f. 145, 146. Binney, Check List, No. 369.
Anculosa (*Mudalia*) *turgida*, Haldeman, Supplement to No. 1, Monog. Limniades, Oct. 1840. Wheatley, Cat. Shells U. S., p. 28.
Leptoxis turgida, Haldeman, Monog. Leptoxis, p. 5, t. 5, f. 151. Binney, Check List, No. 393. Brot, List, p. 26.

5. *Shell smooth, globose, or flattened above.*

12. A. trilineata, Say.
Melania trilineata, Say, New Harmony Dissem., No. 18, p. 227, Sept. 9, 1829. Say's Reprint, p. 19, 1840. Binney's Edition, p. 144. Catlow, Conch. Nomenc. p. 189.
Anculosa trilineata, Say, DeKay, Moll. N. Y., p. 100. Wheatley, Cat. Shells U. S., p. 27. Jay, Cat. Shells, 3d Edit., p. 62.
Anculotus trilineatus, Say, Jay, Cat., 4th Edit., p. 276. Reeve, Monog. Anculotus, t. 5, f. 41, b.
Leptoxis trilineata, Say, Haldeman, Monog. Leptoxis, p. 5, t. 5, f. —. Binney, Check List, No. 389. Brot, List, p. 26.

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* I had at first united this to *dissimilis*, and I am yet doubtful whether it is really distinct from that protean species.

† Young of *dilatata*. In placing all these specific names together as synonyms, I am sustained by the decisions of Mr. Lea, (Philos. Trans. viii. p. 171,) Haldeman, Monog. Leptoxis, and Anthony, Proc. Bost. Soc. Nat. Hist. i. p. 5.

‡ Most nearly allied to the heavy, obsoletely angulated form of *dissimilis*.

Variety.

Melania viridis,* Lea, Philos. Proc. ii. p. 12, Feb. 1841. Philos. Trans., viii. p. 172, t. 5, f. 19. Obs. ii. p. 12. DeKay, Moll. N Y., p. 95. Wheatley, Cat. Shells U. S., p. 27. Binney, Check List, No. 292. Catlow, Conch. Nomenc. p. 189.

13. A. subglobosa, Say.

Melania subglobosa, Say, Journ. Acad. Nat. Sci. v. p. 128, Sept. 1825. Binney's edit. p. 116. Binney, Check List, No. 254. Catlow, Conch. Nomenc. p. 188. Jay, Cat. 3d Edit., p. 62.

Anculotus subglobosus, Say, Conrad, New Fresh-Water Shells, p. 60, t. 8, f. 14. DeKay, Moll. N. Y., p. 103. Reeve, Monog. Anculotus, t. 1, f. 10. Jay, Cat. 4th Edit., p. 276.

Anculosa subglobosa, Say, Wheatley, Cat. Shells U. S., p. 28.

Leptoxis subglobosa, Say, Haldeman, Monog. p. 3, t. 2, f. 40—58. Chenu, Manuel de Conchyl. i. f. 2040—42. Binney, Check List, No. 387. Brot, List, p. 25.

Melania subglobosa, Lea, Troost, Cat. Shells Tenn., p. 42.

Anculosa gibbosa, Philos. Proc. ii. p. 34, Apr. 1841. Philos. Trans. ix. p. 15. Obs. iv. p. 15. Wheatley, Cat. Shells U. S., p. 28.

Anculotus gibbosus, Lea, Reeve, Monog. Anculotus, t. 1, f. 3.

Leptoxis gibbosa, Lea, Binney, Check List, No. 361. Brot, List, p. 25.

Melania globula,† Lea, Philos. Proc. ii. p. 12, Feb. 1841. Philos. Trans. viii. p. 174, t. 5, f. 22. Obs. iii. p. 12. DeKay, Moll. N Y., p. 95. Troost, Cat. Shells, Tennessee. Wheatley, Cat. Shells U. S., p. 25. Binney, Check List, No. 126. Catlow, Conch. Nomenc. p. 187.

Variety.

Anculosa tintinnabulum‡, Lea, Philos. Proc. iv. p. 167, Aug. 1845. Philos. Trans. x. p. 67, t. 9, f. 51. Obs. iv. p. 67.

Anculotus tintinnabulum, Lea, Reeve, Monog. Anculotus, t. 2, f. 13. a, b. ?

Melania virgata,§ Lea, Philos. Proc. ii. p. 13, Feb. 1841. Philos. Trans. viii. p. 175, t. 5, f. 25. Obs. iii. p. . DeKay, Moll. N. Y., p. 95. Troost, Cat. Shells Tenn. Binney, Check List, No. 290. Catlow, Conch. Nomenc. p. 189. Wheatley, Cat. Shells U. S., p. 27.

14. A. praerosa, Say.

Melania prærosa, Say, Jour. Acad. Nat. Sci. ii. p. 177, Jan. 1824. Binney's Edit., p. 70. Catlow, Conch. Nomenc. p. 188. Sowerby, Conch. Man. f. 314.

Anculotus prærosus, Say, Conrad, New Fresh-Water Shells, p. 59, t. 8, f. 13. Jay, Cat. 4th Edit., p. 276. Reeve, Monog. Anculotus, t. 2, f. 15, 16.

Anculotus præmorsa, Say, Woodward, Manuel, t. 8, f. 28.

Anculosa prærosa, Say, Ravenel, Cat. p. 11. Wheatley, Cat. Shells U. S., p. 28. Anthony, List, 1st and 2nd Edits. Kirtland, Rep. Zool. Ohio, p. 174. DeKay, Moll. N. Y., p. 103.

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* In treating *viridis* as a synonym of *trilineata*, I agree with the opinions expressed by Messrs. Haldeman, Brot, Binney and Anthony. The two former gentlemen, together with Dr. Jay, consider *costatus*, Anthony, and *occidentalis*, Lea, as synonyms also. In this opinion I cannot coincide. The two species appear to me to be well separated by the costæ of Mr. Anthony's species, and the uniformly smooth surface of *trilineatus*. Mr. Reeve's figure of *trilineatus* is very poor; the bands are so represented as to appear like ribs.

It is by no means certain that *trilineata* is an *Anculosa*. Its general appearance suggests affinities with the *Amnicolidæ*, to which family several small species, hitherto considered to be *Anculosæ*, have been recently removed. It differs from all the *Amnicolæ*, however, in its colored bands.

Mr. Lea's *M. viridis* is the Var. B. of Mr. Say's description of *trilineata*.

† Juvenile shell.

‡ Distinguished by possessing three brown bands or rows of maculations. It is a beautiful variety.

§ Young shell of var. *tintinnabulum*.

Leptoxis prærosa, Say, Haldeman, Monog. Lept. p. 2, t. 1, f. 1—18. Chenu, Manuel, i. f. 2030—34. Binney, Check List, No. 380. Brot, List, p. 25.

*Melania angulosa**, Menke, Syn. Meth., 1st Edit., p. 81, 1828. 2nd Edit. p. 135, 1830. Binney, Check List, No. 15.

Melania cruentata, Menke, Syn. Meth., 1st Edit., p. 80, 1828. 2nd Edit. p. 134, 1830.

Melonia ovularis, Menke, Syn. Meth., 1st Edit., p. 80. 2nd Edit. p. 134. Binney, Check List, No. 194.

Melanopsis neritiformis, Deshayes, Encyc. Meth. Vers. ii. p. 438, No. 14. Anim. Sans. Vert., 2nd Edit., viii. p. 492, 1838.

Anculotus angulatus,† Conrad, New Fresh-Water Shells, p. 60, t. 8, f. 15, 1834. Dekay, Moll. N. Y., p. 102. Wheatley, Cat. Shells U. S., p. 27. Reeve, Monog. Anculotus, t. 6, f. 51. Jay, Cat. Shells, 4th Edit., p. 276.

Leptoxis angulata, Conrad, Binney, Check List, No. 340.

Melania Cincinnatiensis‡, Lea, Philos. Proc. i. p. 66, Dec. 1838. Philos. Trans. viii. p. 190, t. 6, f. 58. Obs. iii. p. 28. Jay, Cat. 4th Edit., p. 273. Catlow, Conch. Nomenc. p. 186.

Anculotus Cincinnatiensis, Lea, DeKay, Moll. N. Y., p. 95. Troost, Cat. Shells Tenn.

Leptoxis Cincinnatiensis, Lea, Binney, Check List, No. 346.

15. A. crassa, Haldeman.

Anculosa crassa, Haldeman, Monog. Limniades, No. 4, p. 3 of Cover, Oct. 5, 1841.

Anculotus crassus, Haldeman, Jay, Cat., 4th Edit., p. 276. Reeve, Monog. Anculotus, t. 2, f. 14.

Leptoxis crassa, Haldeman, Monog. Lept. p. 2, t. 1, f. 19—23. Binney, Check List, No. 350. Brot, List, p. 24.

16. A. tæniata,§ Conrad,

Anculotus tæniatus, Conrad, New Fresh-Water Shells, p. 63, 1834. DeKay, Moll. N. Y., p. 103. Jay, Cat., 4th Edit., p. 276. Reeve, Monog. Anculotus, t. 6, f. 50, *non* t. 2, f. 15.

Anculosa tæniata, Conrad, Wheatley, Cat. Shells U. S., p. 28.

Leptoxis tæniata, Conrad, Haldeman, Monog. Leptoxis, t. 3, f. 71—73. Binney, Check List, No. 388. Brot, List, p. 26.

Anculosa coosæensis,‖ Lea, Proc. Acad, Nat. Sci. p. 54, 1861. Jour. Acad. Nat. Sci. v. pt.3, p. 257, t. 30, f. 65, Mar. 1863. Obs. ix. p. 76.

17. A. Troostiana, Lea,

Anculosa Troostiana, Lea, Philos. Proc. ii. p. 34. Philos. Trans. ix. p. 15. Obs. iv. p. 15. Wheatley, Cat. Shells U. S., p. 28.

Anculotus Troostianus, Lea, Reeve, Monog. Anculotus, t. 4, f. 30.

Leptoxis Troostiana, Lea, Haldeman, Monog. Leptoxis, p. 4, t. 3, f. 81. Binney, Check List, No. 391. Brot, List, p. 26.

18. A. pinguis, Lea.

Melania pinguis, Philos. Trans. x. p. 301, t. 30, f. 11. Obs. v. p. 57. Binney, Check List, No. 206. Brot, List, p. 40. Reeve, Monog. Melania, sp. 355.

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* The various descriptions by Menke and Deshayes all certainly belong to this species, as Messrs. Haldeman and Anthony long ago decided.

† This is a half grown shell which still retains the angle on the periphery in Alabama, while, in specimens of more northern location, it is only visible in the quite young.

‡ Undoubtedly the quite young shell of *prærosa*.

§ Intermediate in form between *rubiginosa* and *prærosa* and distinguished by its elongated body whorl, concavely flattened around its upper half.

‖ Young Shell.

19. A. pisum, Haldeman.
Leptoxis pisum, Haldeman, Monog. Lept. p. 4, t. 3, f. 82. Binney, Check List, No. 378. Brot, List, p. 25.

20. A. contorta, Lea.
Anculosa contorta, Lea, Proc. Acad. Nat. Sci. p. 187, 1860. Jour. Acad. Nat. Sci. v. pt. 3, p. 258, t. 35, f. 66, Mar. 1863. Obs. ix. p. 80.
Leptoxis contorta, Lea, Binney, Check List, No. 347. Brot, List, p. 24.

21. A. vittata, Lea.
Anculosa vittata, Lea, Proc. Acad. Nat. Sci. p. 188, 1860. Jour. Acad. Nat. Sci. v. pt. 3, p. 256, t. 35, f. 63, Mar. 1863. Obs. ix. p. 78.
Leptoxis vittata, Lea, Binney, Check List, No. 397. Brot, List, p. 26.

22. A. planospira, Anthony.
Melania planospira, Anthony, Ann. Lyc. Nat. Hist. N. Y., vi. p. 123, t. 3, f. 24, Mar. 1854. Binney, Check List, No. 208. Brot, List, p. 40. Hanley, Conch. Misc. Melania, t. 8, f. 67.
Anculotus planospira, Anthony, Reeve, Monog. Anculotus, t. 2, f. 11.

23. A. ampla, Anthony.
Anculosa ampla, Anthony, Ann. N. Y., Lyc. Nat. Hist. vi. p. 159, t. 5, f. 22, 23.
Leptoxis ampla, Anthony, Binney, Check List, No. 339. Brot, List, p. 23.

Variety a.

Anculosa elegans, Anthony, Proc. Acad. Nat. Sci. p. 69, Feb. 1860.
Anculotus elegans, Anthony, Reeve, Monog. Anculotus, t. 6, f. 49.
Leptoxis elegans, Anthony, Binney, Check List, No. 356. Brot, List, p. 24.

Variety b.

Anculosa formosa, Lea, Proc. Acad. Nat. Sci. p. 187, 1860. Jour. Acad. Nat. Sci. v. pt. 3, p. 254, Mar. 1863. Obs. ix. p. 76.
Leptoxis formosa, Lea, Binney, Check List, No. 358. Brot, List, p. 24.

24. A. zebra,* Anthony.
Anculosa zebra, Anthony, Proc. Acad. Nat. Sci. p. 69, Feb. 1860.
Anculotus zebra, Anthony, Reeve, Monog. t. 6, f. 52.
Leptoxis zebra, Anthony, Binney, Check List, No. 398. Brot, List, p. 26.

25. A. picta, Conrad.
Anculosa picta, Conrad, Am. Jour. Science, 1st Ser., xxx. p. 342, t. 1, f. 15, Jan. 1834. Wheatley, Cat. Shell U. S., p. 28. Hanley, Conch. Misc. Melania, t. 5, f. 39.
Anculotus pictus, Conrad, New Fresh-Water Shells, p. 62, 1834. Reeve, Monog. Anculotus, t. 3, f. 20. Jay, Cat. 4th Edith., p. 276. DeKay, Moll. N. Y., p. 103.
Leptoxis picta, Conrad, Haldeman, Monog. Lept. t. 3, f. 74—80. Binney, Check List, No. 377. Brot, List, p. 25.
Anculosa Foremani, Lea, Philos. Proc. ii. p. 243, Dec. 1842. Philos. Trans. ix. p. 29. Obs. iv. p. 29. Wheatley, Cat. Shells U. S., p. 28.
Leptoxis Foremani, Lea, Binney, Check List, No. 359.
Anculosa flammata, Lea, Philos. Proc. ii. p. 243. Philos. Trans. ix. p. 30. Obs. iv. p. 30.
Anculotus flammatus, Lea, Reeve, Monog. Anculotus, t. 3, f. 18.
Leptoxis flammata, Lea, Binney, Check List, No. 357.

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* Differs in form from *picta*, Con., but so much resembles in coloring the variety *flammata*, described by Mr. Lea, that I doubt whether it is distinct.

26. A. **ornata**, Anthony,
Anculosa ornata, Anthony, Proc. Acad. Nat. Sci. p. 67, Feb. 1860.
Anculotus ornatus, Anthony, Reeve, Monog. Anculotus, t. 3, f. 24.
Leptoxis ornata, Anthony, Binney, Check List, No. 375.

27. A. **Lewisii**, Lea.
Anculosa Lewisii, Lea, Proc. Acad. Nat. Sci. p. 54, 1861. Jour. Acad. Nat. Sci. v. pt. 3, p. 257, t. 35, f. 64, Mar. 1863. Obs. ix. p. 79.

28. A. **squalida**, Lea.
Anculosa squalida, Lea, Philos. Proc. iv. p. 167, Aug. 1845. Philos. Trans. x. p. 66, t. 9, f. 50. Obs. iv. p. 66.
Anculotus squalidus, Lea, Reeve, Monog. Anculotus, t. 3, f. 26 ?
Leptoxis squalida, Lea, Binney, Check List, No. 386. Brot, List, p. 25.

29. A. **patula**, Anthony.
Anculosa patula, Anthony, Proc. Acad. Nat. Sci. p. 68, Feb. 1860.
Anculotus patulus, Anthony, Reeve, Monog. Anculotus, t. 4, f. 32.
Leptoxis patula, Anthony, Binney, Check List, No. 376. Brot, List, p. 25.

30. A. **viridula**,* Anthony.
Anculosa viridula, Anthony, Proc. Acad. Nat. Sci. p. 68, Feb. 1860.
Anculotus viridulus, Anthony, Reeve, Monog. Anculotus, t. 4, f. 34.
Leptoxis viridula, Anthony, Binney, Check List, No. 396.

31. A. **humerosa**, ? Anthony.
Paludina humerosa, Anthony, Proc. Acad. Nat. Sci. p. 71, 1860.

32. A. **ligata**,† Anthony.
Anculosa ligata, Anthony, Proc. Acad. Nat. Sci. p. 67, Feb. 1860.
Anculotus ligatus, Anthony, Reeve, Monog. Anculotus, t. 3, f. 19.
Leptoxis ligata, Anthony, Binney, Check List, No. 367. Brot, List, p. 24.

33. A. **turbinata**, Lea.
Anculosa turbinata, Lea, Proc. Acad. Nat. Sci. p. 54, 1861. Jour. Acad. Nat. Sci. v. pt. 3. p. 254, Mar. 1863. Obs. ix. p. 76.

Doubtful and Spurious Species.

A. (*Paludina*) *nuclea*, Lea, = *Amnicola.*
A. (*Paludina*) *virens*, Lea, = *Amnicola.*
A. Spixiana, Lea, Reeve and Brot, = *Angitrema.*
A. incisa, Lea, Haldeman, Monog., = *Schizostoma.*
A. cingenda, Anthony, MSS., = young of *carinata*, *Lea*, a variety of *dissimilis.*
A. planulata, Lea, Wheatley, Cat. Shells, p. 28, Alabama, (desc. not published.) = *ampla*, Anth. ?
? *Mel. carinata*, Ravenel, Cat. p. 11, Yadkin River, N. C.
? *Mel. costata*, Ravenel, Cat. p. 11, Dan River, Va. = *dissimilis.*?
? *A. subcarinata*, Ravenel, Cat. p. 11, Susquehannah, = *dissimilis.* ?
A. integra, Sap, = *Somatogyra.*
A. subglobosa, Say, = *Somatogyra.*
A. (*Paludina*) *altilis*, Lea, = *Somatogyra.*
Paludina altilis, Ravenel. = *Somatogyra*,

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* Mr. Reeve thinks this = *Rogersii*, Conr., and Dr. Brot believes it to be *dilatata*, Conr. Although it approaches very closely to *dilatata*, it is a distinct species. It occurs also in North Carolina.

† Close to *Coosænsis*, Lea, (*tæniata*, Conr.) but is more constricted, has three bands only, and is not maculate. It is stouter and more conical.

New Species of MORDELLISTENA collected in Illinois.

BY CHAS. A. HELMUTH, M. D.

A. Hind tibiæ with two oblique, parallel, equal ridges.

a. First joint of hind-tarsi with two, second with one ridge.

M. NIGRICOLLIS. Body black, head rufous, thorax entirely black; anterior feet and middle tibiæ and tarsi testaceous; posterior feet and abdomen tinged with testaceous; elytra with two yellow bands, the anterior one interrupted at the suture; ·08. (an Var. *M. trifasciatæ ?*)

M. DIMIDIATA. Fuscous, linear; head, thorax, antennæ, anus, anterior and middle feet, and posterior tibiæ and tarsi reddish-yellow, ridges black; elytra fuscous, with light-brown pubescence, suture and lateral margin very narrowly piceous; ·09.

M. BIPLAGIATA. Black; elytra with a reddish-yellow oval humeral spot; basal joints of antennæ, palpi, tibiæ, tarsi and abdomen reddish, ridges black; ·13.

b. First and second joints of hind-tarsi each with two ridges.

M. BIPUSTULATA. Black, mouth, front, two small spots on the apical margin of the thorax and anterior feet reddish-yellow; pubescence light-brown sericeous; ·09.

c. First joint of hind-tarsi with three, second with two ridges.

M. RUBRILABRIS. Black; linear; mouth rufous, ·13.

B. Hind tibiæ with two parallel ridges, the anterior one extending almost across the outer face of the tibiæ.

a. First joint of hind-tarsi with two, second with one ridge.

M. PICILABRIS. Black; pubescence grayish; mouth and basal joints of antennæ piceous, ·08.

b. First joint of hind tarsi with three, second with two ridges.

M. GUTTULATA. Black; mouth piceous; elytra with numerous spots of cinereous pubescence; ·11.

C. Hind tibiæ with three short, oblique, parallel ridges, and a rudiment of a fourth one.

a. First joint of hind tarsi with three, second with two ridges.

M. SCALARIS. Black; mouth, anterior feet, and four basal joints of antennæ piceous; pubescence grayish-brown; thorax with three black clouds, each elytron with a very undulated band before the middle, beginning near the lateral margin and joining that of the other side at the scutellum, and a large oblong spot near the apex fuscous; ·17.

D. Hind tibiæ with four ridges.

a. First joint of hind tarsi with four, second and third each with three ridges.

M. FUSCO-ATRA. Very slender; dark fuscous; four basal joints of antennæ, anterior and middle feet piceous; pubescence brown-sericeous; ·14.

b. First joint of hind tarsi with five, second with three ridges.

M. SUTURELLA. Black; pubescence of head and thorax brownish, of elytra black, with the suture narrowly gray; ·17.

c. First joint of hind tarsi with five, second with three, third with two ridges.

M. RUFIVENTRIS. Black; pubescence of head and thorax brownish, of elytra black, with the suture narrowly gray; abdomen rufous, varied with black; ·20.

Descriptions of New Species of Birds of the Families CÆREBIDÆ, TANAGRIDÆ, ICTERIDÆ, and SCOLOPACIDÆ.

BY GEO. N. LAWRENCE.

Fam. *CÆREBIDÆ.*

Dacnis ultramarina.

D cærebicolor, Lawr. nec. Scl., Ann., N. Y. Lyc. Vol. vii., p. 291.

Male. General color ultramarine blue, lores, chin, throat, middle of back, wings and tail black; the black on the throat dull in color; the wing coverts, quills and central tail feathers margined with ultramarine blue; bill black, the base of the under mandible below flesh color; iris brown; tarsi and toes reddish yellow.

Length 4⅝ in.; wing 2⅝; tail 1⅞; bill ½; tarsi 9-16.

The female is yellowish green, with the front, part of the crown and sides of the head bluish; throat ashy; the under plumage lighter green, the middle of the abdomen yellowish.

Habitat. New Granada, Isthmus of Panama.

In distribution of colors this species closely resembles *cærebicolor* Scl., and *cayana*; it is, however, lighter in color than the first, and darker than the last; it differs from both in the black not extending behind the eye, in the dull color of the black spot on the throat, which in the others is of a deep black and more clearly defined; *cærebicolor* is purple blue, and *cayana* greenish or verditer blue.

Fam. *TANAGRIDÆ.*

Saltator intermedius.

S. magnus, Lawr. nec. Gm., Ann., N. Y. Lyc. Vol. vii. p. 297.

Male. Upper plumage yellowish olive green; the front and top of the head intermixed with bluish cinereous; a white stripe from the bill over the eye; sides of the head bluish cinereous; tail of the same color as the upper plumage; quills brownish black, the outer webs same color as the back; chin white; on the throat is a tawny or fulvous spot entirely surrounded by a narrow band of black, which runs down on each side of the throat and assumes a rounding form on the upper part of the breast; breast and abdomen cinereous tinged with pale tawny; under tail coverts bright fulvous; bill black; iris brown; legs reddish brown.

Length 8 in.; wing 4⅛; tail 4; bill ¾; tarsi 1.

The female differs only in the black not extending across the breast below the fulvous spot.

Habitat. New Granada, Isthmus of Panama.

At the time of referring this species to *S. magnus*, I had but a single example, a female, which much resembles that species, and I would not have inclined to separate them, but since then receiving other specimens of both sexes, and finding the fulvous spot on the throat of the male to be encircled with black, as in *S. magnoides*, I have not hesitated to pronounce it a distinct species. It differs from *magnus* in the fulvous spot not only being brighter and deeper in color, but of three times the extent; in having a black band on the breast, and in the color of the under tail coverts being much darker, more rufous. From *magnoides* it differs in the head above being mixed with olive green, in the white on the chin extending to the bill, whereas, in *magnoides* the black lines on the sides of the throat come together on the chin; the fulvous on the throat is not quite so bright, but is of twice the extent of that of *magnoides*, and the black band on the breast of only about one-third the breadth of it in that species; the breast of *magnoides* is of a clear cinereous and the crissum lighter than in the new bird.

In color and markings it seems to be intermediate between *magnus* and *magnoides*, the crissum, however, in my species is darker than in either of the others.

Fam. *ICTERIDÆ.*

CASSICUS VITELLINUS.

Cassicus icteronotus, Lawr. nec Vieill., Annals of Lyc. of N. Hist., N. Y., Vol. vii. p. 297.

Male. Deep velvety black, with the lower part of the back, a broad mark on the wing coverts next the back, upper and under tail coverts, basal half of tail feathers and crissum, deep yellow or yolk-of-egg color; the upper middle tail coverts are tipped with black; upper mandible yellowish white, lower pale plumbeous white; iris blue; tarsi and toes black.

Length 12 in.; wing 7⅛; tail 4¾; bill 1 9-16; tarsi 1⅜.

The female differs only in being smaller, and measures in length 9½ in.; wing 5½; tail 4; bill 1¼; tarsi 1 1-16.

Habitat.—New Granada, Isthmus of Panama, where it is very abundant; I have also seen it from Nicaragua.

This species, which I mistook for *C. persicus*, Linn., (*icteronotus*, Vieill.), at first sight appears much like it, but differs in being larger, in the yellow being much deeper in color, the upper mandible much stronger, with the culmen more curved, and the base of the upper mandible in front much broader; but the most marked difference is in the extent of the yellow on the tail feathers, on the central feathers reaching two inches from the base, and decreasing a little on the outer ones, giving a rounding form to the mark of this color on the tail; but in *C. persicus*, the yellow, although reaching about the same distance from the base on the central feathers, extends rapidly towards the end of the tail on the outer ones, on the second and third lateral feathers coming within one and a quarter inches of the end; in other words, in looking towards the end of the tail, the yellow mark in my species is rounding in form, whereas, in *persicus*, the mark of this color is very deeply hollowed out.

Fam. *SCOLOPACIDÆ.*

EREUNETES OCCIDENTALIS.

Adult in spring. Upper plumage varied with black, bright chestnut, ashy brown and white, each feather having a black centre, with bright chestnut margins and tipped with greyish white; the central upper tail coverts brownish black, the outer coverts white spotted with black near their ends, central tail feathers blackish brown, the other tail feathers light ash; primaries and secondaries blackish brown on their outer webs and tips, and dark ash on their inner webs; outer tertials dark ash, the inner black in the centre with bright chestnut margins; scapulars bright chestnut in the centre, broadly black near the end, and terminating with white; wing coverts ashy brown with greyish edgings; front sides of the crown to eye and under plumage white; a dusky line tinged with rufous extends from the bill to the eye; ear coverts rufous; front, sides of the head and throat marked with minute spots of ashy brown, breast and sides conspicuously marked with much larger spots of dark brown; under tail coverts white, a few with central dark brown spots; iris brown; bill and feet jet black.

Length 6¼ in.; wing 3¾; tail 1¾; bills from ⅞ to 1 1-16; tarsi ⅞.

Habitat.—Pacific coast; California, Oregon.

This species differs from *pusillus* in the greater amount and brightness of the chestnut coloring of the upper plumage, but most conspicuously in the more decided character of the spots on the breast and sides, these being very much larger than those of *pusillus;* the bills also appear to average longer, and the tarsi and toes are jet black, which in the other are yellowish green.

The tertials are very long, reaching nearly to the end of the longest primary; the feet are semipalmated about the same as those of *pusillus.* Eleven specimens from the Pacific coast are now before me, four of my own and the others belonging to the Smithsonian Institution, kindly sent me by Prof. Baird for examination; three have their bills 1 1-16 in. in length—all have the bright chestnut coloring above and are conspicuously spotted below, with the legs uniformly deep black. Those killed even towards the end of July retain the chestnut color above and the spots on the under plumage, whereas at that time *E. pusillus* has scarcely any rufous coloring above, and is below entirely destitute of spots, with a wash of a light tawny color on the upper part of the breast.

Mr. E. Coues suspected probably that more than one species existed in North America, for in his able Monograph of the Tringæ, published in the Proc. of the Phil. Acad. of Sci., 1861, p. 177, in a note under *E. pusillus*, he says, "I am by no means satisfied that but a single species of *Ereunetes* exists in N. A. The difference in size, in length and proportions of the tarsus even, and especially in the bill, cause it to seem almost impossible that all the specimens before me are specifically the same," &c.

He however made no positive determination of there being more than one species. See his remarks in the note referred to above.

I have had specimens of the so-called *E. mauri* sent me from Cuba by Dr. Gundlach for examination, and have found it to agree precisely with examples of *pusillus* from the Atlantic coast.

Descriptions of six New Species of UNIONIDÆ from Lake Nyassa, Central Africa, &c.

BY ISAAC LEA.

The specimens herein described are of unusual interest. They are the first which I have seen from Central Africa, and I am greatly indebted for them to the liberality of John Kirk, M. D., of Edinburgh, who accompanied the Zambezi Expedition, under the British Government, as Medical Officer and Botanist. There are six in number, all of which I believe to be undescribed. The three *Spathæ* have the peculiar African type, and probably were furnished with syphons. In one of the species we have, for the first time, an *alate* type. The three *Uniones* differ from any type I have heretofore seen from Africa, and they take more of that of India in the subtriangular form—*Rajahensis*, (nobis,) for instance—and in the subplicate character of some of our southern species—inclining to nodulous. It is greatly to be regretted that none of the soft parts were preserved, that we might compare their anatomy with those from America. Lake Nyassa is one of the three great central lakes of Africa, and has a southern drainage in the Zambezi River. It is, in extent, as Dr. Kirk informs me by letter, "exceeding two hundred miles north and south, and from fifteen to sixty miles wide, and is fifteen hundred feet above the sea. It lies between the parallels of 14° and 18° south latitude.

UNIO KIRKII.—Testâ plicatâ, triangulari, subinflatâ, ad latere planulatâ, inæquilaterali, anticè rotundatâ, posticè angulatâ; valvulis crassis, anticè crassioribus; natibus valdè prominentibus, solidis, ad apices undulatis; epidermide viridi, radiis capillaris indutâ; dentibus cardinalibus crassis, sulcatis; lateralibus subrectis, curtis, crassis, in valvulo sinistro tripartitibus; margaritâ argenteâ et iridescente.

Hab.—Lake Nyassa, Central Africa. John Kirk, M. D., of the Zambezi Expedition.

UNIO NYASSAENSIS.—Testâ plicatâ, triangulari, subinflatâ, ad latere planulatâ, inæquilaterali, anticè rotundatâ, posticè angulatâ; valvulis subcrassis, anticè crassioribus; natibus prominentibus, solidis, ad apices undulatis; epidermide luteo-corneâ, obsoletè radiatâ; dentibus cardinalibus parviusculis, sulcatis; lateralibus subrectis, curtis, crassis, in utroque valvulo duplicibus; margaritâ salmonis colore tinctâ et iridescente.

Hab.—Lake Nyassa, Central Africa. John Kirk, M. D., of the Zambezi Expedition.

Unio Aferula.—Testâ valdè plicatâ, obliquâ, subcompressâ, valdè inæquilaterali, anticè rotundâ, posticè subbiangulatâ; valvulis crassiusculis, anticè crassioribus; natibus subprominentibus, solidis, ad apices undulatis; epidermide luteo-corneâ; dentibus cardinalibus parviusculis, sulcatis; lateralibus subrectis, curtis, in utroque valvulo duplicibus; margaritâ dilutè salmonis colore tinctâ et valdè iridescente.

Hab.—Lake Nyassa, Central Africa. John Kirk, M. D., of the Zambezi Expedition.

Spatha alata.—Testâ alatâ, sulcatâ, triangulari, compressâ, valdé inæquilaterali, anticè obliquè rotundatâ, posticè obtusè angulatâ; valvulis crassiusculis; natibus parvis, vix prominulis; epidermide olivaceâ, nitidâ, obsoletè radiatâ; margaritâ purpureâ et valdè iridescente.

Hab.—Lake Nyassa, Central Africa. John Kirk, M. D., of the Zambezi Expedition.

Spatha Nyassaensis.—Testâ subsulcatâ, ellipticâ, lenticulari, compressâ, valdè inæquilaterali, anticè rotundâ, posticè obtusè angulatâ; valvulis crassiusculis; natibus parvis, vix prominulis, ad apices minutè undulatis; epidermide rufo castaneâ vel luteolâ, obsoletè radiatâ; margaritâ purpurescente et valdè iridescente.

Hab.—Lake Nyassa, Central Africa. John Kirk, M. D., of the Zambezi Expedition.

Spatha modesta. — Testâ subsulcatâ, transversâ, subcompressâ, inæquilaterali, posticè et anticè rotundâ; valvulis tenuibus; natibus parvis, prominulis, ad apices minutè undulatis; epidermide tenebroso-olivaceâ, eradiatâ, nitidâ; margaritâ cæruleo-albâ et valdè iridescente.

Hab.—Fresh-waters near Mozambique, Africa. John Kirk, M. D., of the Zambezi Expedition.

Description of six new species of SUCCINEA of the United States.

BY ISAAC LEA.

S. Haleana.—Testâ obliquo-ovatâ, nitidâ, subdiaphanâ, aureâ, tenui; spirâ brevi; suturis impressis; anfractibus ternis, convexis; aperturâ grandi, lato-ovatâ; labro regulariter expanso; columellâ incurvâ.

Hab.—Alexandria, Louisiana, J. Hale, M. D.

S. Grosvenorii.—Testâ obliquo-ovatâ, striatâ, subdiaphanâ, stramineâ, tenui; spirâ exsertâ; suturis valdè impressis; anfractibus quaternis, convexis; aperturâ subrotundâ, grandiusculâ; labro expanso; columellâ incurvâ et contortâ.

Hab.—Santa Rita Valley, Kansas? Mr. H. C. Grosvenor; and Alexandria, Louisiana, J. Hale, M. D.

S. Mooresiana.—Testâ obliquo-ovatâ, minutè striatâ, opacâ, albidâ, subtenui; spirâ exsertâ; suturis impressis; anfractibus ternis, convexiusculis; aperturâ subrotundâ; labro subexpanso; columellâ incurvâ et contortâ.

Hab.—Court House Rock, on Platte River, California route, Mr. H. Moores.

S. Wilsonii.—Testâ elongato-obliquâ, valdè striatâ, diaphanâ, peraureâ, subnitidâ, tenui; spirâ valdè exsertâ; suturis valdè impressis; anfractibus quaternis, convexiusculis; aperturâ grandiusculâ, ovatâ; labro subexpanso; columellâ, tenui, incurvâ et contortâ.

Hab.—Near Darien, Georgia, S. W. Wilson, M. D.

S. Forsheyi.—Testâ elongato-obliquâ, tenui, nitidâ, diaphanâ, subaureâ, pertenui; spirâ exsertâ, acuminatâ; suturis impressis; anfractibus ternis,

convexiusculis; aperturâ grandi, lato-ovatâ; labro subexpanso; columellâ tenui, incurvâ et contortâ.

Hab.—Rutersville, Texas, Prof. C. G. Forshey.

S. PELLUCIDA.—Testâ elongato-obliquâ, lævi, nitidâ, pellucidâ, albâ, pertenui; spirâ exsertâ, acuminatâ; suturis impressis; anfractibus quaternis, vix convexis; aperturâ grandiusculâ, ovatâ; labro subexpanso; columellâ tenui, incurvâ et contortâ.

Hab.—United States.

Since I published, in 1841 and previously, a number of new species of *Succinea*, Dr. Binney's Terrestrial Shells of the United States has appeared. In vol. 2d, pages 65 and 66, he gives eight of my species with the Latin diagnoses, and says he had seen *Wardiana*, *Totteniana*, *Nuttalliana* and *aurea*, but has no knowledge of the others, except what he derived from descriptions and figures. He says that, "on a careful examination, it appears to us that *S. aperta* and *S. aurea* are well established species; that *Wardiana* is synonymous with *avara*, Say; *Totteniana* with *ovalis*, Say; *Nuttalliana* with *ovalis*, Gould; *inflata* with *campestris*, Say; that *retusa* is probably synonymous with *ovalis*, Gould; and that *Oregonensis* cannot be at present ascertained." All naturalists must regret introducing this kind of confusion in a difficult branch of science, and had Dr. Binney given more time to the subject,—my types being always open to his inspection,—I cannot doubt but that he would have avoided this attack upon my species. His editor, Dr. Gould, has in part corrected his synonymy, and Mr. W. G. Binney, in the continuation of his father's beautiful work (vol. 4), makes further correction of these hasty and erroneous criticisms. Dr. Gould says that *Nuttalliana* "no doubt is a well marked species;" of course it is not *ovalis*, Gould; that *Oregonensis* is "decidedly a well marked species." *Totteniana*, Dr. Gould says, differs from *ovalis*, Say, that "it is a thinner and more fragile shell, proportionally more ventricose in form, with a shorter spire, a larger aperture," &c. Mr. W. G. Binney says, in vol. 4, p. 34, that in regard to *inflata* he "is inclined to doubt its specific weight." On a careful examination and comparison of specimens with *campestris*, sent to me as such by Dr. Ravenel, from Sullivan's Island, South Carolina, I find these agree with the description of Mr. Say and Dr. Binney, except that the full-grown specimens show a fourth whorl, and not three, as both authors state in their description. This, I think, arises from their mode of counting. If a fourth whorl can be seen on a specimen, even if it be not complete, I always count as four whorls, as fractions cannot conveniently and correctly be enumerated in small shells. My *inflata* has but three whorls, is smoother, more inflated and more obtuse in the spire. With these differences it ought not to be made a synonym until more observations, under better circumstances, should prove it to be such. As regards *Totteniana*, Mr. W. G. Binney says he "agrees entirely with Mr. Lea and Dr. Gould in separating it from *obliqua*, Say."

After a careful examination of the original specimens, with the addition of subsequent acquisitions, I am perfectly satisfied of the correctness of my first convictions, as to there being eight species, which Dr. Binney would reduce to two, and they may be stated as follows:

S. APERTA, Dr. Binney allows to be established.

S. AUREA, Dr. Binney allows to be established.

S. RETUSA, Dr. Binney says is probably *ovalis*, Gould. It differs, nevertheless, in being retuse at the base and in being less inflated.

S. WARDIANA, Dr. Binney says is synonymous with *avara*, Say. But *Wardiana* is a more slender species, and is more oblique. It is evident that Dr. B. figures two species under this name, pl. 67c.

S. TOTTENIANA.—Dr. Binney says this is synonymous with *ovalis*, Say.[*] But Dr. Gould properly says it differs in being more fragile, and has a shorter spire. It also differs in color. The interior of all my specimens is iridescent, a character I have never seen in *ovalis*. Mr. W. G. Binney says (v. 4,) he "agrees entirely with Lea and Gould in separating it from *obliqua*, Say."

S. NUTTALLIANA.—Dr. Binney says this is synonymous with *ovalis*, Gould. Dr. G., however, says this "no doubt is a well-marked species." It certainly is very different from *ovalis*, Gould, being much more slender, more oblique, and different in color. In fact I believe that Dr. Gould has described the same shell as *rusticana*, in his volume of "Expedition Shells, p. 28."

S. OREGONENSIS.—Dr. Binney says that this "cannot at present be ascertained." Dr. Gould says that the specimens furnished by Mr. Lea "leave no doubt of being decidedly a well-marked species." *Oregonensis* is perhaps nearest to *Wardiana*, but that shell has a smoother surface, is greenish, while *Oregonensis* is yellowish, and in the turns of the spire they differ entirely.

S. INFLATA.—Dr. Binney makes this synonymous with *campestris*, Say. Mr. W. G. Binney says he "is inclined to doubt its specific weight." *Inflata* is smoother, more inflated and more obtuse in the spire, as well as in really having one whorl less. It ought to be retained until more specimens could be examined. This species was founded on a single specimen sent by Dr. Ravenel, who also sent me the true *campestris*.

Description of a new Species of PLANORBIS.

BY ISAAC LEA.

PLANORBIS BILLINGSII.—Testâ lævi, planulatâ, supernè plano-convexâ, subtùs lato umbilicatâ, estriatâ; anfractibus quaternis; labro acuto; aperturâ grandiusculâ, subrotundâ, obliquâ.

Hab.—Ottowa River, Canada West, E. Billings, Esq.

Descriptions of Thirteen New Species of MELANIDÆ of the United States.

BY ISAAC LEA.

GONIOBASIS SUBRHOMBICA.—Testâ subcarinatâ, subfusiformi, subtenui, tenebroso-olivâ, estriatâ, evittatâ; spirâ obtusâ; suturis impressis; anfractibus quinis, planulatis, supernè carinatis; aperturâ grandi, rhomboideâ, intus albidâ; labro acuto, vix sinuoso; columellâ tenui et aliquantò contortâ.

Hab.—Hog Creek, North Georgia, J. Clark.

GONIOBASIS FRATERNA.—Testâ carinatâ, fusiformi, subtenui, luteâ, evittatâ vel quadrivittatâ; spirâ obtuso-conicâ; suturis valdè impressis; anfractibus instar senis, planulatis, supernè acuto carinatis; aperturâ parviusculâ, ovato-rhomboideâ, intus albâ; labro acuto, vix sinuoso; columellâ tenui, infernè contortâ.

Hab.—Bibb Co. and Cahawba River, Alabama. E. R. Showalter, M. D.

GONIOBASIS ROMÆ.—Testâ subcarinatâ, conoideâ, subcrassâ, tenebroso-corneâ, evittatâ; spirâ subelevatâ, aliquantò obtusè elevatâ; suturis impressis; anfractibus septenis, planulatis, supernè carinatis; aperturâ grandiusculâ, ovatâ, intus albidâ; labro acuto, subsinuoso; columellâ tenui et contortâ.

Hab.—Rome, North Georgia, Rev. G. White.

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[*] At p. 72, v. 2, Dr. B. says that *Tottentiana* is "unquestionably the same with *obliqua*, Say," considering *obliqua* = *ovalis*, but the figures of the two last species are very different.

Goniobasis quadricincta.—Testâ lævi vel obsoletè plicatâ, subfusiformi, subcrassâ, luteâ, quadrivittatâ; spirâ conoideâ; suturis regulariter impressis; anfractibus instar octonis, planulatis, supernè angulatis; aperturâ grandiusculâ, ovatâ, intus quadrivittatâ; labro acuto, aliquantò sinuoso; columellâ tenui et aliquantò contortâ.

Hab.—Coosa and Cahawba Rivers, Alabama, E. R. Showalter, M. D.; East Tennessee and North Georgia, Bishop Elliott.

Goniobasis Smithsoniana.—Testâ plicatâ, fusiformi, tenebroso-corneâ, subcrassâ, mucronatâ, evittatâ; spirâ obtuso-conicâ; suturis impressis; anfractibus instar septenis, planulatis, in medio angulatis; aperturâ subgrandi, ovato-rhomboideâ, intus albidâ; labro acuto, subrecto; columellâ subcrassâ et aliquantò contortâ.

Hab.—North Georgia, Smithsonian Institution, and East Tennessee, Bishop Elliott.

Goniobasis pulla.—Testâ lævi, exsertâ, subtenui, tenebroso-fuscâ, nitidâ; spirâ elevatâ; suturis regulariter impressis; anfractibus instar septenis, curvatis; aperturâ parviusculâ, ovato-rhomboideâ, intus dilutè purpureâ; labro acuto, subsinuoso; columellâ tenui, purpurescenti, aliquantè contortâ.

Hab.—Cumberland Gap, East Tennessee, Major S. S. Lyon, U. S. Engineers.

Goniobasis pupæformis.—Testâ lævi, pupæformi, crassiusculâ, tenebroso-melleâ, obsoletè quinque vittatâ; spirâ obtusâ; suturis impressis, infernè tumidis; anfractibus instar senis, convexiusculis; aperturâ subgrandi, elongato-pyriformi, intus vittatâ; labro acuto, recto; columellâ supernè incrassatâ.

Hab.—Coosa River, Alabama, E. R. Showalter, M. D.

Trypanostoma venustum.—Testâ lævi, acuminatâ, luteo-corneâ, tenui, mucronatâ, evittatâ; spirâ subelevatâ; suturis impressis; anfractibus novenis, planulatis; aperturâ parviusculâ, subconstrictâ, ellipticâ; labro acuto, subsinuoso; columellâ tenui, subcontortâ.

Hab.—Big Prairie Creek, Alabama, Dr. Showalter.

Trypanostoma cinctum.—Testâ carinatâ, subcrassâ, tenebroso-corneâ; spirâ subelevatâ; suturis impressis; anfractibus instar septenis, planulatis; aperturâ parviusculâ, rhomboideâ, intus albidâ; labro acuto, sinuoso; columellâ infernè incrassatâ et contortâ.

Hab.—North Alabama, Professor Tuomey.

Trypanostoma univittata.—Testâ obtuso-carinatâ, pyramidatâ; subcrassâ, dilutè olivaceâ, nitidâ, univittatâ; spirâ elevatâ; suturis impressis; anfractibus, planulatis; aperturâ parviusculâ, rhomboideâ, intus albidâ, obsoletè univittatâ; labro acuto, sigmoideo; columellâ infernè incrassatâ et valdè contortâ.

Hab.—Cahawba River, Alabama, E. R. Showalter, M. D.

Trypanostoma corneum.—Testâ striatâ, exsertâ, tenui, subdiaphanâ, dilutè corneâ; spirâ elevatâ; suturis regulariter impressis; anfractibus octonis, subconvexis; aperturâ elongatâ, constricto-ellipticâ, intus albidâ; labro acuto, valdè sinuoso; columellâ tenui et contortâ.

Hab.—Tennessee, J. G. Anthony.

Trypanostoma napoideum.— Testâ lævi, obtuso-conoideâ, subcrassâ, corneâ, evittatâ; spirâ curtâ, mucronatâ; suturis impressis; anfractibus septenis, supernè convexiusculis, ultimo inflato; aperturâ grandi, subrhomboideâ, intus albâ; labro acuto, sinuoso; columellâ infernè incrassatâ et valde contortâ.

Hab.—Tennessee, Prof. Troost.

Schizostoma Showalterii.—Testâ lævi, cylindraceâ, productâ, crassâ, melleâ, evittatâ; spirâ exsertâ; suturis valdè impressis, infrâ funiculo instructis;

anfractibus subplanulatis; fissurâ parviusculâ; aperturâ parvâ, ellipticâ, intus albâ; labro acuto, aliquantò sinuoso; columellâ infernè et supernè incrassatâ.

Hab.—Coosa River, Alabama, E. R. Showalter, M. D.

Description of five new Species of LYMNÆA of North America.

BY ISAAC LEA.

Lymnæa Smithsoniana.—Testâ fusiformi, rufo-fuscescente, subdiaphanâ, parum perforatâ, excellissimè transversè striatâ; spirâ obtusâ; suturis impressis; anfractibus senis, convexis; aperturâ grandiusculâ, ovatâ, submarginem fuscâ; labro expanso; columellâ parum incrassatâ et vix plicatâ.

Hab.—Loup Fork of the Platte River, F. V. Hayden, M. D., Surg. U. S. Army.

Lymnæa Traskii.—Testâ fusiformi, tenui, delutè fuscâ, subdiaphanâ, parum perforatâ, minutissimè striatâ, nitidâ; spirâ conoideâ; suturis impressis; anfractibus quinis, convexiusculis; aperturâ parviusculâ, ovatâ; sub marginem fuscâ; labro subexpanso; columellâ incrassatâ et plicatâ.

Hab.—San Antonio Arroya, John B. Trask, M. D.

Lymnæa Jamesii.—Testâ subturritâ, tenuissimâ, albidâ, diaphanâ, perforatâ, striis rectis indutis; spirâ exsertâ; suturis valdè impressis; anfractibus quinis, convexis; aperturâ grandiusculâ, subrotundatâ; labro expanso; columellâ aliquanto plicatâ.

Hab.—Ponds near Cincinnati, Ohio, U. P. James, Esq.; and La Fayette, Walker Co., Georgia, Rev. Geo. White.

Lymnæa Lecontii.—Testâ inflatâ, subcrassâ, perforatâ, excellissimè transversè striatâ; spirâ obtusâ; suturis valdè impressis; anfractibus valdè convexis; aperturâ subrotundâ, grandiusculâ; labro expanso; columellâ medio incrassatâ et impressâ.

Hab.—Georgia, Major John LeConte.

Lymnæa Arctica.—Testâ ellipticâ, subinflatâ, subcrassâ, imperforatâ, minutè striatâ, dilutè corneâ; spirâ obtusâ; suturis impressis: anfractibus convexis; aperturâ lato-ellipticâ, subgrandi; labro regulariter expanso; columellâ medio incrassatâ et magnâ plicâ indutâ.

Hab.—Moose River of Hudson's Bay, Arctic America, Smithsonian Institution.

Descriptions of two new Species of UNIONIDÆ from South Africa.

BY ISAAC LEA.

Spatha Natalensis.—Testâ subsulcatâ, oblongâ, compressâ, subnitidâ, valdè inæquilaterali, ad laterè planulatâ, anticè rotundâ, posticè rotundatâ; valvulis crassiusculis, anticè aliquantò crassioribus; natibus vix prominulis, ad apices minute undulatis; epidermidè tenebroso-rufo-fuscâ, eradiatâ; margaritâ purpureâ et valdè iridescente.

Hab.—Umpingave River, Port Natal, South Africa, Rev. J. McKen.

Unio Natalensis.—Testâ plicatâ, antice sulcatâ, oblongâ, ad laterè planulatâ, valdè inæquilaterali, anticè rotundatâ, posticè obtusè angulatâ; valvulis subcrassis, anticè aliquantò crassioribus; natibus subprominentibus, acuminatis, ad apices undulatis; epidermidè luteolâ, eradiatâ; dentibus cardinalibus compressis, obliquis corrugatisque; lateralibus longis, lamellatis subrectisque; margaritâ dilutè salmonis colore tinctâ et valdè iridescente.

Hab.—Umpingave River, Port Natal, South Africa, Rev. J. McKen.

Descriptions of Twenty-four new Species of PHYSA of the United States and Canada.

BY ISAAC LEA.

Physa Niagarensis.—Testâ suborbiculari, inflatâ, subdiaphanâ, nitidâ, subcrassâ, albidâ; spirâ obtusâ; suturis impressis; anfractibus quaternis, ultimo pergrandi; aperturâ ovatâ, grandi; labro expanso, submarginem albo et incrassato; columellâ medio valdè incrassatâ, impressâ et plicâ indutâ.
Hab.—Niagara River, New York.

Physa Altonensis.—Testâ ellipticâ, subcrassâ, læviusculâ, pallido-castaneâ; spirâ breviusculâ; suturis impressis; anfractibus quinis, ultimo grandi; aperturâ ovatâ, subgrandi; labro acuto, subtèr marginem incrassato et crocato-vittatâ; columellâ infernè magnâ plicâ indutâ.
Hab.—Alton, Illinois, Henry Lea.

Physa crocata.—Testâ ellipticâ, subtenui, nitidâ, crocatâ; spirâ obtusâ; suturis impressis; anfractibus quaternis, ultimo grandi et subinflato; aperturâ ellipticâ; labro acuto, subtèr marginem crocato-vittatâ, columellâ medio incrassatâ, impressâ et contortâ.
Hab.—Lafayette, Walker county, Georgia, Rev. G. White.

Physa Forsheyi.—Testâ subfusiformi, subcrassâ, subopacâ, luteo-corneâ; spirâ exsertâ, acuminatâ; suturis valdè impressis; anfractibus senis, ultimo subgrandi; aperturâ parviusculâ, ovatâ, subconstrictâ; labro subtèr marginem incrassato et fusco-vittato; columellâ incrassatâ et medio impressâ contortâque.
Hab.—Near Rutersville, Texas, Prof. C. G. Forshey.

Physa tenuissima.—Testâ subfusiformi, tenuissimâ, fragilissimâ, diaphanâ, nitidâ, albidâ; spirâ productâ; suturis vix impressis; anfractibus quaternis, convexiusculis, ultimo pergrandi et subcompresso; aperturâ grandi, elongato-ovatâ; labro acuto, subexpanso; columellâ tenui, vix contortâ.
Hab.—Alexandria, Louisiana, J. Hale, M. D.

Physa Halei.—Testâ latè ovatâ, inflatâ, diaphanâ, tenui, albidâ; spirâ obtusâ; suturis impressis; anfractibus quinis, ultimo grandi, aperturâ rotundatâ; labro regulariter expanso, subtèr marginem albo et incrassato; columellâ medio incrassatâ, impressâ et plicâ indutâ.
Hab.—Alexandria, Louisiana, J. Hale, M. D.

Physa Febigerii.—Testâ ellipticâ, pellucidâ, politâ, pallidâ; spirâ obtusâ, curtâ; suturis vix impressis; anfractibus quinis, ultimo grandi et subconstricto; aperturâ ovatâ, supernè angulatâ; labro acuto, intus incrassato, columellâ vix impressâ.
Hab.—Logan Co., Ohio, Major G. L. Febiger, U. S. A.

Physa Nicklinii.—Testâ ellipticâ, subcompressâ, diaphanâ, politâ, tenuissimâ, margaritaceâ; spirâ obtusâ; anfractibus quaternis, subconstrictis, convexiusculis, ultimo magno; aperturâ elongato-ovatâ; labro arquato; columellâ medio parum impressâ, contortâ et parvâ plicâ indutâ.
Hab.—Callaghan's, Alleghany Co., Va., P. H. Nicklin, Esq.

Physa Grosvenorii.—Testâ ovato-fusiformi, subrectâ, subinflatâ, vel albidâ vel dilutè stramineâ, politâ; spirâ aliquantò exsertâ; suturis impressis; anfractibus quinis; ultimo grandiusculo; aperturâ ovatâ, subgrandi; labro subexpanso, subtèr marginem incrassato; columellâ incrassatâ; valdè, impressâ; plicatâ et valdè contortâ.
Hab.—Santa Rita Valley, Kansas? Mr. H. C. Grosvenor.

Physa Whitei.—Testâ subinflatâ, tenui, subdiaphanâ, parum nitidâ, albidâ;

spirâ subacutâ; suturis valdè impressis; anfractibus quaternis, convexis, ultimo grandi et parum inflato; aperturâ ellipticâ, subtèr marginem incrassatâ et pallido-salmoniâ; labro incrassato, subconstricto; columellâ impressâ et contortâ.

Hab.—Lafayette, Walker Co., Georgia, Rev. G. White, and Verdigris River, Kansas, F. Hawn.

Physa Saffordii.—Testâ fusiformi, subcompressâ, opacâ, albidâ, politâ, crassiusculâ; spirâ parum productâ, acuminatâ; suturis impressis; anfractibus quinis, ultimo grandi; aperturâ ovatâ, grandiusculâ; labro parum expanso, subtèr marginem incrassato et dilutè fusco; columellâ parum incrassatâ et vix plicatâ.

Hab.—Lebanon, Wilson Co., Tenn., J. M. Safford; Verdigris River, Kansas, F. Hawn; Nashville, Prof. Troost.

Physa Hawnii.—Testâ fusiformi, subcompressâ, crassâ, albidâ; spirâ exsertâ, subobtusâ; suturis impressis, ultimo inflecto; anfractibus senis, convexis, ultimo grandi; labro parum expanso, subtèr marginem incrassato et rufo-fuscescente; columellâ valdè incrassatâ vix plicatâ.

Hab.—Verdigris River, Kansas, F. Hawn.

Physa anatina.—Testâ subfusiformi, subinflatâ; diaphanâ, tenui, albidâ; spirâ exsertâ, acuminatâ; suturis valdè impressis; anfractibus senis, convexiusculis, ultimo grandi; aperturâ parviusculâ, subconstrictâ; labro subexpanso, subtèr marginem incrassato et crocato; columellâ medio impressâ, et contortâ.

Hab.—Northern Tributary of the Arkansas River, Kansas, F. Hawn.

Physa parva.—Testâ fusiformi, subconstrictâ, diaphanâ, politâ, pertenui, tenebroso-corneâ; spirâ exsertâ, acuminatâ; suturis impressis; anfractibus quaternis, convexiusculis, ultimo grandi; aperturâ parviusculâ, constrictâ; labro subexpanso, margine acuto; columellâ impressis, vix plicatâ.

Hab.—Verdigris River and Rock Creek, Kansas, F. Hawn.

Physa Showalterii.—Testâ subfusiformi, subinflatâ, subdiaphanâ, subtenui, pallido-cornea; spirâ parùm productâ, acuminatâ; suturis valdè impressis; anfractibus quinis, convexis, ultimo grandi; aperturâ magnâ, ellipticâ; labro regulariter expanso, subtèr marginem latè incrassato et crocato; columellâ medio valdè impressâ, incrassatâ, contortâ, et plicâ indutâ.

Hab.—Uniontown, Alabama, E. R. Showalter, M. D.

Physa Smithsoniana.—Testâ ellipticâ, subtenui, subdiaphanâ, nitidâ, pallido-fuscâ, ferè olivaceâ; spirâ subacutâ; suturis impressis; anfractibus quinis, convexiusculis, ultimo grandi et parum constrictâ; aperturâ elongato-ellipticâ; labro parum incrassato, subtèr marginem tenebroso-fuscâ; columellâ impressâ et contortâ.

Hab.—Loup Fork of the Platte River, F. V. Hayden, M. D.

Physa Warreniana.—Testâ inflatâ, tenui, diaphanâ, nitidâ, albidâ; spirâ obtusâ; suturis impressis; anfractibus quinis, ultimo pergrandi et valdè inflato; aperturâ latè ellipticâ; labro acuto subtèr marginem fusco et albido vittatâ; columellâ medio impressâ et contortâ.

Hab.—Loup Fork of the Platte River, F. V. Hayden, M. D.; Milwauki, Wisconsin, H. C. Grosvenor; and Grand Rapids, Michigan, A. O. Currier.

Physa Traskii.—Testâ valdè inflatâ, parum obliquâ, striatâ, subdiaphanâ, tenuissimâ, pallido-castaneâ; spirâ parùm productâ; apice acuto; suturis impressis; anfractibus senis, ultimo pergrandi et valdè inflatâ; aperturâ latè expansâ; labro acuto, subtèr marginem fusco-vittatâ; columellâ medio impressâ et magnâ plicâ indutâ.

Hab.—Rio Los Angelos, California, J. B. Trask, M. D.

Physa striata.—Testâ latè ovatâ, obliquè inflatâ, latè striatâ, subdiaphanâ, pertenui, color columbæ; spirâ subobtusâ; anfractibus quinis, convexiusculis, ultimo pergrandi; aperturâ magnâ, latè ellipticâ; labro regulariter expanso, subtèr marginem parùm incrassato et crocato; columellâ medio impressâ, parùm incrassatâ et plicâ indutâ.

Hab.—Salt Lagoon, near Monterey, California, J. B. Trask, M. D.

Physa Blandii.—Testâ ovato-subfusiformi, subobliquâ, inflatâ, dilutè stramineâ vel albidâ; spirâ obtusâ; suturis impressis; anfractibus quaternis, ultimo inflato et pergrandi; aperturâ ovatâ, subgrandi; labro expanso, subtèr marginem incrassato et pallido crocato; columellâ incrassatâ, impresssâ, plicatâ et contortâ.

Hab.—California, Mr. Thomas Bland.

Physa Nuttallii.—Testâ inflatâ, subdiaphanâ, parùm nitidâ albidâ; spirâ obtusâ, curtâ; suturis impressis; anfractibus quaternis, convexis, ultimo pergrandi et inflato; aperturâ grandi, subrotundâ, subtèr marginem pallido-fuscâ; labro acuto, valdè expanso; columellâ leviter incrassatâ, et contortâ.

Hab.—Lewis' River, Oregon, Prof. Thomas Nuttall.

Physa venusta.—Testâ subcylindraceâ, tenuissimâ, diaphanâ, nitidâ, albâ; spirâ curtâ, acuminatâ; suturis leviter impressis; anfractibus quaternis, convexiusculis, ultimo pergrandi; aperturâ magnâ, elongato-ovatâ, subtèr marginem fuscâ; labro acuto et sinuoso, vix expanso; columellâ parum impressâ.

Hab.—Near Fort Vancouver, Oregon, Sir George Simpson.

Physa hordacea.—Testâ subcylindraceâ, pellucidâ, politâ; dilutè rufâ; spirâ subelevatâ subacutâ; suturis subimpressis; anfractibus quinis, ultimo grandi et constricto; labro acuto, margine rufo lineato; aperturâ ovatâ, supernè acutè angulatâ; columellâ aliquantò impressâ et incrassatâ.

Hab.—Vancouver Island, Oregon, Sir George Simpson.

Physa brevispira.—Testâ lævi, lato-ellipticâ, albidâ, diaphanâ, inflatâ; spirâ brevissimâ, obtusâ, vix exsertâ; anfractibus ternis, ultimo grandi et inflato; labro acuto, margine intus incrassato; aperturâ pergrandi et dilatatâ; columellâ incrassatâ, impressâ et contortâ.

Hab.—Ottowa River, Canada West, E. Billings, Esq.

A Critical Review of the Family PROCELLARIDÆ:—Part II.; Embracing the PUFFINEÆ.

BY ELLIOTT COUES, M. D.; U. S. A.

The present paper is the second of a series in which it is proposed to consider the entire family of Petrels. The first fasciculus in which the Procellarieæ or "Stormy Petrels" are reviewed, has already appeared in these Proceedings; in the present continuation of the subject are embraced the Puffineæ, or "Shearwaters."

In writing upon the Procellarieæ I had regard more particularly to the generic disposition of the species; for most of them were so well known as to require comparatively little comment upon their specific distinctions. With the Puffineæ, however, the case is exactly the reverse. While the generic groups are very plainly indicated, the species comprised in each are for the most part quite numerous, and their relations to each other, generally so very intimate, as regards size, form, and color, that it requires careful and discriminating comparison to separate them. I have, therefore, given this part of the subject in hand special attention; and have gone considerably into details in my examination of the specific characters and relationships of the numerous components of the group, believing that in no other way can the desirable degree of information on the subject be attained. At

the same time the many intricate questions of synonymy involved have necessitated somewhat lengthy discussions.

In my arrangement of the genera and species I have closely followed that given by Bonaparte in his Conspectus; except that I place among the Puffineæ the genus *Adamastor*, which Bonaparte considers as belonging to the Fulmareæ. The position of this genus is, indeed, a little uncertain, the characters of the bill approximating to those of the Fulmareæ. Its bill, however, is almost identical with that of *Majaqueus;* and it agrees so closely in other respects that the two genera cannot be placed in different groups; while the possession by each of twelve, instead of fourteen or sixteen rectrices, plainly indicates that they belong to the Puffineæ rather than to the Fulmareæ.

The Puffineæ, as I regard them, are composed of five genera, viz:—*Majaqueus*, *Adamastor*, *Thiellus*, *Nectris* and *Puffinus*. The two first of these are very different from the three last in many respects; and warrant a subdivision of the section into two groups. The first, or the "*Fulmar-Puffins*," have the bill stouter than ordinary; the nasal tubes longer, more elevated, more decidedly tubular, vertically truncated at their apices, and the nasal septum thinner; the wings and tail shorter. The three latter of the above-named genera constitute the "*Puffins* proper." The bill is very long and slender; the nasal tubes short, broad, depressed, obliquely truncated; the nasal septum thick; the wings and tail very long, the latter much rounded; and the feet very large. As for the genera themselves, they are hardly worth retaining, except it be for convenience' sake. *Thiellus* is merely *Nectris* with a longer and more decidedly cuneiform tail,; while *Nectris* hardly differs from *Puffinus*, except in its rather slenderer bill, and entirely fuliginous color. The subdivision of *Puffinus* into "Ardenna," "Priofinus," and "Puffinus" seems quite unwarrantable.

I shall consider the species of the five genera in the order in which they are named above, and conclude with a brief synopsis of the section in accordance with the results arrived at in the investigation.

MAJAQUEUS, Reich.

Gen. char.—Bill a little shorter than the head, about equal to the tarsus, stout, compressed, higher than broad at the base, the culmen rising immediately from the nostrils, the unguis large, very convex, much hooked. Commissure unusually curved from feathers to unguis, the concavity looking up wards; outline of inferior mandibular rami quite straight to the unguis. Nasal tubes long, (nearly a third the length of the culmen), elevated, laterally obliquely flattened, carinated along the median line, apically vertically truncated, with a considerable emargination; nostrils quite circular; the septum narrow for this section. Wings very short for this family. Tail also exceedingly short, and subtruncated, the graduation of the lateral feathers being slight. Feet stout, the tarsus greatly abbreviated, being much shorter than the middle toe without its claw. Outer toe without claw longer than the middle. Tip of the inner claw reaching the base of the middle one. Of large size, dark color, and exceeding robust form.

The preceding paragraph characterizes a marked and very peculiar genus of Procellaridæ. It is at once distinguished from all its allies by the combination of the large size, extreme robustness of bill and feet, as well of the whole body, the unusually short wings and tail, the dark colors, etc. It is most nearly allied to *Adamastor*, the bills of the types of the two genera being almost identical; but other characters readily distinguish the two.

Two species of this genus are recognized by ornithologists. Dr. Schlegel has well shown that it is rather by peculiarities of form and size that *conspicillatus* is to be distinguished, if at all, from *aequinoctialis*.

MAJAQUEUS AEQUINOCTIALIS, Reich ex Linn.

Procellaria aequinoctialis, Linn., S.N., ed. vi. (1758), Id. ed. xii., i., 1766, p. 213. Gmel. S. N. i., p. 564. Lath. Ind. Orn. ii., 1790, p. 821, et auctorum. *P. aequinoxialis*, Vieillot, Nouv. Dict. d' H. N., 1817, xxv., p. 422. *Priofinus aequinoctialis*, Hombr., et Jacquin. *Majaqueus aequinoctialis*, Reich, Syst. Av., pl. 20, fig. 340, 341. Bonaparte, Consp. Avium, ii. 1856, p. 200.

Puffinus capitis Bonæ-spei, Brisson, Ornith. vi. 1760, p. 137. *Procellaria nigra*, Forster, Descr. Anim, ed. Licht. 1844, p. 26. "*Procellaria fuliginosa*, Solander."

Habitat.—"In oceano Australi extra tropicum, (nunquam visa ad lineam aequinoctialem, unde patet, in ipsum nomen '*aequinoctialis*' non quadrare." (FORSTER).

It is unnecessary to give any description of this long and well known species.

The white spots on the throat and cheeks appear to vary much with age. In the perfectly adult bird the triangular gular spot is alone left; that on the cheeks, which is connected with it in immature birds, having disappeared. Very young birds have the under parts almost wholly whitish, which afterwards deepens into fuliginous.

The present is one of the three species of Procellaridæ, (*pelagica*, *aequinoctialis*, *capensis*), known to Linnæus in 1758, and given in the sixth edition of his Systema Naturæ. The name *aequinoctialis* appears, according to the observations of most naturalists, to be geographically erroneous; and probably on this account it was changed to *nigra* by Forster in 1772. But as it is impossible to say exactly what are the limits of a Procellaridian's wanderings, it would be hardly warrantable, I think, to change Linnæus' appellation.

There are no points of synonymy which require discussion here.

MAJAQUEUS CONSPICILLATUS, Bp. ex Gould.

Procellaria conspicillata, Gould, Ann. et Mag. N. H., 1844, 1ma. series xiii., p. 362. Id. Birds Austr. vii. pl. 46. Schlegel, Mon. *Proc.* Mus. Pays-Bas, 1863, p. 20. *Majaqueus conspicillatus*, Bonap. Consp. Av. ii., 1856, p. 200.

Procellaria larvata, Lesson.

Habitat.—Australian Seas.

This species, despite the peculiar markings of the head, which usually characterize it, is, nevertheless, exceedingly closely allied to the preceding. Examination of the large series in the Philadelphia Academy collection shows the markings to be very variable as to their extent, and that they are sometimes hardly traceable at all. (Consult on this point Dr. Schlegel's monograph, where the point is fully elucidated.) In the majority of specimens the submental white patch is more or less perfectly connected with a broad white stripe, which, passing from the feathers on the side of the lower mandible, runs backwards on the side of the head, below the eye, curving upwards on the occiput, so as nearly to meet its fellow of the opposite side. In addition to this, a broad somewhat crescentic patch occupies the anterior portion of the vertex, and descends on the cheeks in front of the eyes nearly or quite to the commissure of the bill, leaving the features of the extreme front black. The colors in every other respect are those of *aequinoctialis*.

More constant and reliable, though not so conspicuous, diagnostic features are to be found in other characters. The bird is larger than *aequinoctialis*; its bill is a little longer and considerably more robust, and has the unguis of both mandibles *bluish black* instead of bright yellow. The sides of the mandibles are also usually much darker in color. The wings and tail, on an average, exceed those of *aequinoctialis* by an inch or so, but the variation with individuals of both species amounts to more than this. A corresponding relative difference exists in the average length of the tarsus and toes.

There are no points of synonymy connected with this species which require notice.

ADAMASTOR, Bon.

Char. Gen.—Of large size and robust form. Bill a little shorter than the head, about three-fourths the tarsus, broad and stout at the base, narrowing regularly to the strong, very convex compressed unguis. Nasal tubes longer than ordinary (for the Puffineæ) very broad, depressed, but vertically truncated at their extremity, and with an unusually thin septum, somewhat as in the Fulmareæ, to which the genus bears considerable analogy. Wings rather short for this section; the primaries broad and stout, the second quite as long as the first. Tail rather short, of twelve feathers; the central rectrices projecting and a little acuminate; the lateral more rounded, and rapidly graduated. Feet of the usual size, moderately compressed and stout. Tarsus shorter than the middle toe without its claw. Outer toe longer than the middle. Tip of outer claw about reaching base of middle.

The genus *Adamastor* was founded in 1856 by Bonaparte to accommodate certain Procellaridians, which seem to combine in a remarkable manner the characteristics of both the Fulmareæ and the Puffineæ. The species resemble most the Fulmareæ in the length, vertical truncation and thin septum of the nasal tubes; and also less markedly in the shape of the wings and tail. In all other respects they are, however, true Puffineæ. The bill, in shape and comparative size, can hardly be distinguished from that of *Majaqueus aequinoctialis*, which is one of the Puffineæ. The most essential character of the bill of the Fulmareæ is that the outline of the unguis of the lower mandible is about straight and ascending; that of the Puffineæ is very concave and decurved. *Adamastor* possesses the latter character. Again, the tail of the Fulmareæ has fourteen (*Fulmarus*) or sixteen (*ossifraga*) rectrices; the tail of *Adamastor* but twelve. The large stout feet, too, are those of Shearwaters, and not of Fulmars. From these manifold considerations I think that it is manifest that the proper affinities of the somewhat anomalous genus are decidedly with the Puffineæ, rather than with the Fulmareæ, among which Bonaparte has located it.

It is not a little surprising that so great confusion and uncertainty should have reigned concerning so marked a species as *P. cinereus*, Gmel, the type of this peculiar genus. On my remarks, infrà, upon *A. cinereus*, and also upon *Puffinus Kuhlii*, I hope I have elucidated several vexed questions of synonymy satisfactorily.

Three species are known to me to compose this genus.

ADAMASTOR CINEREUS Coues ex Gmel.

Procellaria cinerea, Gmelin, Syst. Nat., I. pars 2, 1788, p. 563. Latham, Ind. Ornith., ii. 1790, p. 824. Vieillot, Nouv. Dict. d'H. N., 1817, xxv. p. 418. Sed non *Proc.* vel *Puff.* vel *Nectr. cinereus*, Kuhl, Cuv., Temm., Degl., Keys. et Blas. Schinz., Schleg. nec al auct. Europ. recent. ferè omnium, quæ *P. Kuhlii*, Boie: nec Audubon, et auct. Americ. quæ *P. major* Faber.

Puffinus cinereus, (Gm.) Lawrence, Birds N. A., 1858, p. 835; ex Californiâ. (Homonyma accuratè enumerata; descriptio præstans; et observationes pertinentes.)

Procellaria hæsitata, Forster, Descript. Anim., ed. Licht., 1844, p. 208. Gould, Birds Austr., vii. pl. lxvii. et Reichenbach, Syst. Av., pl. xxiv. fig. 2604; nec Kuhl, Beit. Zool., p. 142; nec Temm., Pl. color tab. 416; quæ species *Astrelatæ* generis, teste Bonaparteo. *Puffinus hæsitatus*, Lawrence, Ann. New York Lyc. Nat. Hist., 1853, vi. p. 5.

Adamastor typus, Bonaparte, Consp. Avium, ii. 1856, p. 187. Comptes Rendus Ac. Sc. Tab. *Longip.*—*Procellaria adamastor*, Schlegel, Monog. Proc. Mus. Pays-Bas, 1863, p. 25.

Puffinus Kuhlii, Cassin, Proc. Acad. Nat. Sci. Philada., June, 1862, p. — (Specimena ipsa a me visa.) Sed non Boie, nec auct.

?*Procellaria melanura*, Bonn, Encyc. Method.

*Description.**—Form typically that of the genus, which see, *suprà.*

Color.—The nasal tubes, and culmen as far as the unguis, are black ; the unguis is pale yellowish. The sides of the upper mandible, as far as the sulcus which separates them from the culmen, yellow, as are the sides of the lower mandible and its unguis ; the sulcus of the lower mandible and its commissural edge being bluish black. [Compare FORST. Descr., p. 208.] Feet in the dried specimen dingy bluish or yellowish green, dusky exteriorly and posteriorly, the webs yellow, the claws light brown, with black tips. Above a uniform cinereous, of much the same shade over the whole upper parts ; some of the feathers, especially the scapulars and tertials, with just appreciably lighter tips ; the crown of the head and the circumocular region a little deeper cinereous than elsewhere. The wing coverts of the specimen in question are interspersed with feathers of a dull brownish rather than cinereous hue. These are evidently old worn ones, and doubtless indicate that in this species, as in others, the newer and fresher the feathers the clearer and more decided is the *cinereous* hue. The color of the upper parts has no line of demarcation with the white of the lower on the sides of the head and neck. Insensibly fading away, it extends quite around on the chin and throat, but is more restricted on the sides of the neck. The primaries are blackish cinereous on their outer webs and at their tips ; light greyish cinereous internally and basally ; their shafts are light brown. The inferior surfaces of the wings, together with the axillary feathers and some feathers on the sides of the body under the wings, are dull brownish cinereous. The tail feathers and the entire under tail coverts, from the anus backwards, are deep blackish or sooty cinereous, the rectrices the darkest. The rest of the under parts are white.

Dimensions.—Length about 19 inches. Bill along culmen 1·80 ; from feathers on side of lower mandible to its apex 1·50 ; height of bill at base ·65 ; width of bill at base ·60. Wing from the carpus 13·00 ; tail 5·75 ; exterior rectrices 1·25 shorter. Tarsus 2·40 ; middle toe and claw 2·90 ; outer do. 3·00 ; inner do. 2·50. Length of nasal tubes ·45, inches and hundredths.

Bibliography.—As I have endeavored to prove, in my discussion of the synonyms of *P. Kuhlii* (which see), the *Proc. cinerea*, Gmelin, is really the present species, and not the common Atlantic bird to which the name *cinereus* has been generally applied by European authors. Bonaparte, indeed, was completely convinced of this ; and it is the more singular that he does not adopt Gmelin's name, but prefers to confer a new specific designation,—viz. : *typus*, in direct violation of one of the most firmly established laws of nomenclature. To Mr. G. N. Lawrence is due the credit of restoring Gmelin's name to the species to which it rightfully belongs.

The *Proc. hæsitata* of Forster is most undoubtedly, I think, the present species. His description is pertinent in every respect ; and his remarks concerning the form and color of the bill will apply to no other species. The *hæsitata* of Gould's Birds of Australia, and of Lawrence, (Ann. New York Lyc. Nat. Hist.,) is the same bird. The *hæsitata* of Kuhl's Monograph and of Temminck's Planches Colorées is apparently, however, not this species, but the *Astrelata diabolica*, Bp. ex L'Herm.

I quote "*P. melanura*, Bonn." on authority of Bonaparte, not having an opportunity of verifying the reference.

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* The accompanying description was taken from a fully mature specimen from the coast of California, off Monterey, kindly furnished for examination by Mr. Lawrence. It is the example from which Mr. Lawrence's description of *P. hæsitata*, in the Annals of the New York Lyceum, and of *P. cinereus*, in the Birds of North America, was taken : is not incompatible in any feature with *P. cinereus*, Gm., Lath.. Vieill.; agrees entirely with Forster's *P. hæsitata*, with Bonaparte's *Adamastor typus* and Schlegel's *Proc. adamastor*.

The following resumé of the points under discussion is given for convenience of reference:

Proc. cinerea, Gm., Lath., Vieill. (1817); (nec auct. Europ. quæ *P. Kuhlii*, Boie; nec auct. Amer. quæ *P. major*, Faber) = *Puffinus cinereus*, Lawrence, 1858 = *Adamastor typus*, Bp., 1856 = *Proc. adamastor*, Schlegel, 1863 = *Adamastor cinereus*, Coues, 1864.

Proc. hæsitata, Forst., 1774 = *Puff. hæsitata*, Lawrence, 1853 = *P. hæsitata*, Gould (sed non *P. hæsitata*, Kuhl, 1823, nec Temm. Pl. Color. quæ species *Astrelatæ*) = *P. cinereus*, Gm.

Dr. Lichtenstein, in his edition (1844) of Forster's Descriptiones Animalium, says that the *leucocephala* of Forster (which is also the *alba* of Linn., Gm., Lath.) "vix nisi ætate videtur differre a *hæsitata* Forster." It is well known that the present species when young has the cinereous of the head much lighter than that of the adults; and Prof. Lichtenstein's surmise may therefore be correct. As, however, there are several points of form, etc., in which it seems to differ from *hæsitata*, and especially as Bonaparte has considered it a valid species of *Astrelata*, I shall follow the latter authority until more definite data may be found upon the subject.

ADAMASTOR GELIDUS Coues ex Gmel.

Procellaria gelida, Gmelin, Syst. Nat., i. pars 2, 1788, p. 564. Latham, Index Ornith., ii. 1790, p. 822. Vieillot, Nouv. Dict. d'Hist. Nat., xxv. 1817, p. 419. (Haud dubiè, opinor.)

Procellaria flavirostris, Gould, Ann. et Mag. N. H., 1844, 1ma ser. xiii. p. 365. *Adamastor flavirostris*, Bp. Consp. Av., 1856, ii. p. 188.

Habitat.—Antarctic Ocean. Cape of Good Hope.

Sp. char.—"Feathers of the head and all the upper surface brown, with paler edges, fading into white on the tips of the upper tail coverts; wings and tail deep blackish brown; all the under surface pure white; the feathers of the under surfaces of the shoulders with a streak of brown down the centre; bill yellow, passing into dark horn color at the tip; tarsi and feet fleshy white.

"Length 19 inches; bill $2\frac{4}{5}$; wing 15; tail $6\frac{1}{2}$; tarsi $2\frac{3}{8}$; middle toe and claw $3\frac{1}{8}$."—[GOULD.]

This is an exceedingly well marked species, liable to be confounded with no other with which I am acquainted. That it is a species of *Adamastor*, and entirely congeneric with *A. cinereus*, there can be, I think, no doubt. The general coloration and the proportions as indicated by the measurements, plainly evince this to be the case. Moreover, Mr. Gould himself remarks that "this bird so nearly approaches in form the members of the genus *Puffinus*, that it is almost a question whether it should not be included in that genus." A bird which could be placed by so accurate an ornithologist as Mr. Gould in the genus *Procellaria* (*i. e.* among the Fulmareæ), and which yet exhibits such an affinity with the Puffineæ, cannot but belong to the genus *Adamastor*.

Discussion of synonymy.—I think there can be no reasonable doubt that the old *P. gelida* of Gmelin, Latham and Vieillot is really the present species. The habitat and the dimensions given by these authors is the same as that assigned to *flavirostris* by Mr. Gould; and their diagnoses are pertinent in almost every particular. The expression "pedibus cæruleis" is indeed quite inadmissible; but a misinterpretation of the color of the feet of birds of this family is extremely likely to occur when only dried skins are examined. Still I would hardly venture to supersede Gould's *flavirostris* by Gmelin's or Latham's *gelida*, were it not for the fuller and more perfect description of the species given by Vieillot in the work above quoted. An examination of his description will show that it differs in no single consequential point.* In view of these facts, and deeming it of the utmost importance to identify as many of the names of the older authors as possible, I have thought it best to restore Gmelin's appellation.

ADAMASTOR SERICEUS Bp. ex Less.

Puffinus sericeus, Lesson, Man. Ornith., ii. 1828, p. 402. *Adamastor sericeus*, Bp., Consp. Av., 1836, ii. p. 188.

Habitat.—Southern Pacific Ocean.

Sp. char.—Bill black; feet flesh-colored, the margins of the webs blackish. Upper parts deep greyish ashy, passing into blackish grey on the upper wing coverts. Head, neck and under parts white; the former variegated with some touches of clear greyish ash. Circumocular region blackish. Inferior surfaces of the wings of a lighter color than the superior. Tail rounded, its upper surface lightly washed with ashy.

Length 15 inches; extent of wings 36; wing from the carpus 11·50; tail 5; bill along gape 2·00; nasal tubes ·40; tarsus 1·75; middle toe 1·33.

The preceding description is compiled from Lesson's original notice. The indications are not as explicit as might be desired; but I think that there can be no doubt of the propriety of Bonaparte's referring the species to his genus *Adamastor*. The pattern of coloration is rather that of most of the species of *Astrelata;* but the proportions as indicated by Lesson's measurements indicate a bird congeneric with *Adamastor cinereus*.

I have met with no synonyms of this species requiring notice.

THIELLUS Gloger.

Char.—Bill long and slender, about three-fourths the tarsus, compressed, the unguis much decurved, but at base broader than high. Nasal tubes very short, only a fifth of the culmen. Wings of moderate length, and ordinary shape. Tail unusually lengthened, being nearly or quite half as long as the wing from the carpus, very much graduated. Tarsus a fourth longer than the bill, moderately stout, compressed. Middle toe without a claw, a little longer than the tarsus. Of moderate size, rather slender form and uniformly fuliginous colors.

The most essential character of the genus is found in its unusually elongated and much graduated tail. In all other respects it hardly differs at all from *Nectris;* and its species have all the same fuliginous hue that characterizes the latter genus.

Two species are recognized by ornithologists as belonging to this genus. Though exceedingly closely allied to each other, yet they seem to constantly differ in some applicable points.

THIELLUS SPHENURUS Bp. ex Gould.

Puffinus sphenurus, Gould, Ann. et Mag. N. H., 1844, 1ma series, xiii. p. 365. Id. Birds Austral., vii. pl. 58. *Thiellus sphenurus*, Bonap., C. A., 1856, ii. p. 201.—*Procellaria sphenura*, Schlegel, Mon. Proc. Mus. Pays-Bas, 1863, p. 25.

Habitat.—Australian seas.

A fine series of these species is in the collection of the Philadelphia Academy. The general color of the plumage is a deep chocolate brown, or dark reddish black, most of the feathers of the upper parts with paler margins. The color of the back deepens into pure black on the wings and tail. Below, the general plumage is of a deep brown, with a wash of grey,—the brown tinge most palpable on the abdomen, the grey predominating on the throat.

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* I may remark, *en passant*, that the expression "près de *huit* ponces de longueur totale" is most probably a typographical error, or a *lapsus calami*. It was evidently intended to be "*dix huit.*"

The bill is flesh color, tinged with brown; much darker along the culmen and on the unguis; the legs and feet are flesh colored, with a tinge of yellow.

This species measures from 15 to 16 inches in total length; the wing from the carpus 10·50 to 11·25. The tail varies somewhat in length, from nearly five to quite six inches; the graduation of the lateral feathers usually being about 2 inches. Bill about 1·60; height at base ·35, width ·50; length of nasal tubes ·25. Tarsus 1·90; middle toe and claw 2·35.

This species can be confounded with no other, (except, perhaps, *T. chlororhynchus*, which see;) and there are no involved points of synonymy.

THIELLUS CHLORORHYNCHUS Bp. ex Less.

Puffinus chlororhynchus, Lesson, Tr. Ornith., p. 613. Pucheran, Rev. Zoologique, 1850, p. 633. *Thiellus chlororhynchus*, Bp., Consp. Av., ii. 1866, p. 201. *Procellaria chlororhynchus*, Schlegel, Mon. *Proc.* Mus. Pays-Bas, 1863, p. 25.

Habitat.—"Western Australia," Bp. Dr. Schlegel has specimens from the Bourbon Islands and the Cape of Good Hope.

Almost identical with *T. sphenurus* in the color of the plumage; and with much the same dimensions. The main diagnostic points seem to be the following: The bill is of a greenish orange color, except along the culmen and at the tip, where it is black. The bill is longer than that of *sphenurus* by about a fourth of an inch on the average, and appears a little larger at the base, though quite slender in its continuity. While *chlororhynchus* is, upon the whole, a larger bird than *sphenurus*, nevertheless the wings are absolutely shorter (½ an inch or more) on an average. The feet are slightly longer and stouter. In color the present species differs slightly in being rather more cinereous below; but the difference is not well marked.

The species not as yet a well known one, nor contained in many musæa.

NECTRIS Bp. (emend. ex Forst.)

Char.—Generally similar to *Puffinus;* colors uniformly fuliginous; bill and feet wholly or partially light colored. Bill long and slender, much hooked at the tip; nasal tubes short, broad, depressed, very obliquely truncated, the septum broad, the nostrils narrowly oval. Wings reaching a little beyond the tail, which varies in length, but is always more or less rounded. Feet moderate; tarsus about equal to middle toe without claw; outer toe without claw equal to middle; tip of inner claw not reaching base of middle one.

This genus comprises five, perhaps six, species, all agreeing in the uniform fuliginous of their plumage, and in the partial or entire paleness of the bill and feet. In form it hardly differs from *Puffinus*, and its retention as a valid genus is perhaps questionable, except as a matter of convenience in a group where it is of importance to distribute the numerous closely-allied species in as many groups as may be at all characterizable.

NECTRIS FULIGINOSUS, Keys. et Blas. ex Strickl.

Puffinus fuliginosus, Strickland, Proc. Zool. Soc. Lond., 1832, p. 129. Lawrence, Birds N. A., 1858, p. 803, et auct. recent. Sed non *Proc. fuliginosa*, Gm., Lath., quæ probabiliter species *Thalassidromæ* (caudâ furcatâ ex "Otaheite"); nec Banks, tab. 19, Kuhl, sp. 12, pl. x. fig. 6; quæ certè *Pterodroma atlantica*, Gould. Quid sit *Proc. fuliginosa*, Kuhl, p. 148, sp. 27 (ex Banks,) nescio.—*Nectris fuliginosa*, Keys. et Blas. Wirbelt. Europ., 1840, p.

Puffinus major fœmina!) Temminck, Man. Orn., iv. 1840, p. 506. *Puffinus cinereus* (fœmina!), Gould, Birds Europ., pl. 445, fig. 2.

Habitat.—More northern portions of the Atlantic Ocean; especially numerous off the coast of Newfoundland; more rarely on the European coast.

Sp. ch.—Upper parts a uniform fuliginous brownish black, the primaries and tail feathers of a deeper color; under parts a much lighter fuliginous brown, passing into greyish on the throat. Bill entirely brownish black. Feet brownish black, the internal face of the tarsus and the interdigital membranes dusky yellowish. Length, 18 inches; wing, from the carpus, about 12. Bill along culmen, 1·72 to 2·00; along commissure, 2·50; tarsus 2·20 to 2·30; middle toe about 2·50.

This species is too well known to require further characterization.

Discussion of synonymy.—The name "*fuliginosus*" has unfortunately been almost as badly bandied about as has *cinereus*, Gm. Thus the *fuliginosus*, Gm., Lath., apparently (and it is so looked upon by most ornithologists,) belongs to a species of the genus *Thalassidroma*, Vig., from Otaheite, probably not very widely differing from the *Cymochorea melania*, mihi, ex Bp. *Fuliginosa*, Banks, (tab. 19,) Kuhl, (sp. 12, pl, x. fig. 6,) is a species subsequently called *atlantica* by Gould, now the *Pterodroma atlantica*, Bp. Exactly what is the *fuliginosa*, Forster, (Descr. p. 23, sp. 18), is a little doubtful. His editor, Lichtenstein, says that it is the same as *fuliginosa*, Kuhl, sp. 12; and this opinion is also maintained by Bonaparte, which would make it the *Pterodroma atlantica*. But then, on the contrary, Dr Kuhl asserts positively that his species 12 is "omnino diversa a *Nectri fuliginosa*, Forst." For my own part, after carefully studying Forster's description, I am inclined to coincide with Dr. Kuhl, and to hold that Forster's *fuliginosa* is not the *Pterodroma atlantica*, but rather a pacific species of the genus *Nectris*.

Species 27 of Kuhl's monograph, also called *fuliginosa* (after Banks, tab. 23), is too indefinite for me to make anything of it.

No other synonyms of this species seem to require notice. The confounding of this species with *carneipes*, Gould, by Dr. Schlegel, will be noticed under the head of the latter.

NECTRIS AMAUROSOMA, Coues, nov. sp.

Diagnosis.—*Nectris* media quoad staturam inter *fuliginosam* vel *carniepedem* et *tenuirostrem* vel *brevicaudam*; corpore brunneo-fuliginoso, subtus valdè dilutiore, in gulâ fusco-cinerascente; tectricibus alarum inferioribus albidis ferè meris; rostro ex toto fusco; pedibus internè palamisque carneis, externe brunneo-albis. Long. alæ 11·00 poll. Ang. Rostri à fronte ad apicem 1·70. Tarsi 2·00. Digiti medii cum ungue 2·40. Caudæ, 4·25.

Habitat—Mare Pacif., circum capit. Sanct. Lucas, Calif.

Description.—Form. Bill about as long as the head, a little shorter than the tarsus, about two-thirds the middle toe and claw; rather slender, attenuated, compressed, except at base, where it is as wide as high; the unguis large, and much hooked; commissure much curved from base to unguis; outline of rami of inferior mandible quite straight. Nasal tubes rather more than a fourth the length of the culmen, broad, but much depressed, with an indistinct median longitudinal groove; terminally exceedingly obliquely truncated; the nostrils oval. The feathers of the front form a very obtuse angle on the culmen, but instead of immediately retreating on either side, they extend forwards again on the sides of the upper mandible, nearly as far as on the culmen. Wings of ordinary length and shape. Tail rather long, contained only 2½ times in the wing from the carpus; much rounded, as usual in the genus. Feet moderately stout; tarsus just equal to the middle toe without its claw; outer toe without its claw longer than the middle; inner toe unusually abbreviated, the tip of its claw falling ¼ of an inch short of the base of the middle claw.

Color.—The bill is wholly deep brownish black; somewhat lighter on the sides of the lower mandible; the extremity of both ungues horn colored. The inner aspect of the tarsus, the middle and inner toes, the whole of the webs, and the bases of the claws, clear light yellowish flesh color; the outer aspect of the tarsus, the outer toe, and tips of the claws, the same color, but much tinged with brown. The shade of the upper parts is a pure deep chocolate brown, without the slightest tinge of ashy; a little darker on the rump, so dark as to be brownish black on the wing coverts and tertials; the extreme tips of which latter are somewhat paler. The primaries are lustrous brownish black on their outer webs and at their tips; and their inner webs are but little paler; their shafts are on their superior aspect black, becoming brownish basally; their inferior aspects also black, but with a delicate white line running medianly two-thirds their whole length. The rectrices are colored like the primaries; their shafts are brownish black. The entire under wing coverts are white; the purity and continuity of which is, however, interrupted by some grayish brown marbling. The under parts generally are much lighter than the upper, and of a grayish rather than brownish fuliginous, this color passing on the throat and chin gradually into a somewhat grayish cinereous hue. The short anterior under tail coverts are light grayish brown; the long posterior ones are more of a brownish fuliginous. There is a delicate touch of white on the under eyelid.

Dimensions.—Length of bill along culmen 1·70; from feathers on side of lower mandible to its top, 1·60; length of nasal tubes, ·45; height of bill at base, ·45; width about the same. Wing, from the carpus, 11·00; tail, 4·25; graduation of lateral rectrices, ·90; tarsus, 2·00; middle toe and claw, 2·40; outer do., 2·30; inner do., 1·90.

It may seem somewhat improbable that a species of *Nectris* has remained to this late day undescribed; but the subject of the present article differs in so many particulars from any known bird of the genus, that I have not the slightest hesitation in presenting it as new. It is most closely allied to *fuliginosa*, Strickl., but differs from it, as well as from *carneipes* and *tenuirostris*, in many very tangible points. The combination of the wholly dark bill, with the coloration of the feet, as above described, the white on the under surfaces of the wings, together with its own particular dimensions, readily characterize it among its congeners. The following detailed comparison of it with each may serve to define its relationships more explicitly.

With the general colors of *fuliginosus*, especially as regards the wholly dark bill, it differs in the conspicuous white under wing coverts, only a little obscured by grayish brown, and in the different tints and pattern of the feet. (Compare original descriptions of each species.) It is much smaller than that species,—to wit: the length about fifteen inches, (as near as I can judge from the skin,) instead of eighteen; the tarsus barely two inches, instead of two and a quarter; the toes less in proportion; and the wing eleven, instead of twelve inches.

It is more nearly of the same size as *carneipes*, but in that species the "whole of the plumage is chocolate black;" the bill is flesh colored, except on the culmen and at the tip, whereas in my bird it is wholly dark. The feet of *carneipes* are wholly "yellowish flesh color," while in *amaurosoma* the external aspect of the tarsus and the outer toe are brownish white.

The species hardly requires any comparison with *tenuirostris* or *brevicauda*, the notable differences of color alone, or of dimensions alone, at once separating them. The bill of *amaurosoma* measures about 1·70 inches; that of *tenuirostris* 1·20; the wing 11, instead of 10 inches; the tail 4·75 to 5·00, instead of 3·50, etc. The general color of *tenuirostris* is a deep smoky black, with a tinge of ashy; that of *amaurosoma* brownish fuliginous. Compare also the descriptions given in this paper of the colors of the bill and feet. There is just about the same amount of whitish on the under surfaces of the wings of the two species.

The type of this species, now in the Smithsonian collection, was procured by Mr. John Xantus at Cape St. Lucas, Lower California, August 18th, 1860. It is there apparently the representative of *fuliginosus*, as my *opisthomelas* is of *obscurus*.

NECTRIS CARNEIPES, Bp. ex Gould.

Puffinus carneipes, Gould, P. Z. S. xii. March 26, 1844, p. 57. Id. Ann. et Mag. N. H., 1844, xiii. 1ma., series, p. 365. *Majaqueus carneipes*, Reichenbach, Syst. Av., pl. xxiv. fig. 2601. *Nectris carneipes*. Bonaparte, Consp. Av. ii. 1856, p. 201. *Procellaria carneipes*, Schlegel, Mon. Proc. Mus. Pays-Bas, 1862, p. 26, (sinè bonâ ratione *Nect. fuliginos*. Strickl. conjuncta.)

"*Puffinus cinereus*, Smith, Ill. S. Afric., Bds., pl. 56." "*Nectris gama*, Bp. Consp. Av. ii. p. 202;" de utroque teste Schlegelo.

Habitat.—"Numerous in all the seas bounding the western coast of Australia; and breeding on the small islands off Cape Leeuwin."—[GOULD.]

This species is quite closely allied to *fuliginosus*, but differs from it by exceedingly well marked characters. The plumage is much the same in both species, but the bill of *carneipes* is "fleshy white, the culmen and tips of the mandibles brown; the legs, feet, and membranes, yellowish flesh-color." Besides these differences in color, there appear to be equally marked discrepancies in proportions; thus, while *fuliginosus* is eighteen inches long, and *carneipes* only fifteen, the absolute lengths of the bill, feet, and wings is very nearly the same. (Compare original descriptions by Strickland and Gould.) I have never seen any example so small as the one whose measurements are given by Dr. Schlegel, p. 26 of his monograph, but the limits within which any species of this family may vary are very great. But even granting for a moment the identity of the two species, I do not see upon what authority Dr. Schlegel has given the name *carneipes* of 1844 priority over *fuliginosus* of 1832.

Bonaparte, in his Conspectus, has a species *N. gama*, from South Africa, with which he considers *Puff. cinereus*, juv., Smith, as synonymous. I have never had an opportunity of examining a specimen professing to be of this species; but as the diagnosis scarcely shows tangible points of difference, and as Dr. Schlegel is convinced of its identity with *carneipes*, I shall, for the present at least, follow his authority in assigning it as a synonym of that species.

An excellent suite of specimens of *carneipes* is in the collection of the Philadelphia Academy.

NECTRIS TENUIROSTRIS Bp. ex Temm.

Procellaria tenuirostris, Temminck, Pl. Col., No. 587. Schlegel, Mon. *Proc.* Mus. Pays-Bas, 1863, p. 26. *Puffinus tenuirostris*, Temm. et Schl., Faun. Japon. Aves., p. 131, pl. 86. *Nectris tenuirostris*, Bonaparte, Consp. Av. ii. 1856, p. 202. "*Proc. curilicus*, Musæorum Berol. et St. Petersburg."

"*Puff. tristis*, Mus. Parisiensis."

Habitat.—Japan, and neighboring seas.

I have before me a typical example of this marked species, from Niphon, agreeing in every respect with the types of the species as described by Schlegel.

The most peculiar character of form of this species is found in the shape of the bill. It is stout at the base, where it is a little broader than high, but rapidly becomes both compressed and depressed, tapering to a small, weak, only moderately hooked unguis. This unusually weak bill is also short, being much less than the head, and only about two-thirds the tarsus. The nostrils measure about a third the length of the culmen. The commissure and outline of the inferior mandibular rami are both nearly perfectly straight. The wings are very long, reaching much beyond the rest; the primaries are all tapering and acute. The tail is exceedingly short, its length being contained nearly three times in the wing from the carpus, the central retrices projecting a little, the lateral rapidly graduated. The feet are moderately large and stout; the tarsus is about equal to the middle toe without its claw; the outer toe and claw are equal in length to the middle toe and claw; the tip of the inner claw falls short of the base of the middle.

Bill mostly dusky greenish yellow, brighter along the commissure and at tip. Feet yellowish on the anterior, exterior and internal aspect of the tarsus and toes, and the superior surfaces of the webs, the posterior edge of the tarsus, and the under surface of the webs blackish. Above very deep sooty black, becoming pure black on the rectrices and outer webs of the primaries, with a just appreciable ashy nuance on the wing coverts. Inner webs of primaries (except at their tips) and the under surfaces of the wings generally light dull grayish brown. Shaft of primaries black, except along a groove on their under surfaces, which is yellowish. Beneath, the whole body is of a rather light fuliginous or brownish grey, fading, on the throat, (especially in more immature birds) almost into greyish white. The under tail coverts, however, are nearly as dark as the upper parts, only rather more fuliginous.

Dimensions. Wing from the carpus 10·00 inches: central tail feathers 3·50; lateral 2·75; bill along culmen 1·20; depth at base ·30; width at base ·40; tarsus 1·90; middle toe and claw 2·25; outer toe and claw the same; inner toe and claw just equal to the tarsus.

This strongly marked species is distinguished from all its congeners by its small size, weak, peculiarly shaped bill, very short tail, and peculiarly colored feet, The difference in intensity between the colors of upper and under parts are quite appreciable.

Synonymy. The proper name of this species is a matter of no uncertainty, but what designations are to be referred to it as synonyms is more doubtful. Both Bonaparte and Schlegel place "*curilicus*, Pennant," of the museums of Europe, as a synonym, which is merely, however, saying that certain museums have called *tenuirostris*, "*curilicus*," and does not in the least affect the question as to whether *curilicus* be properly a synonym. I am inclined to think that it is not, but that it is rather to be referred to another and larger species of this fuliginous genus.

Bonaparte and Schlegel both consider "*tristis*, Forster, Descr. p. 205," as synonymous with this species. It is difficult to say whether such is or is not the case; but my own impression, derived from a careful study of the characters laid down by Forster, is that his *tristis* refers to a species much larger, and with a stouter bill than the present; possibly the true *curilicus*, Penn.

Nectris brevicauda Bp. ex Brandt.

Puffinus brevicaudus, Brandt, "Ic. Rossic, Av. pl. vi. fig. 17." Gould, Ann. et Mag. N. H., xiii. Ima series, 1844, p. 365. Gould, Birds Austr. viii. pl. 56. *Majaqueus* (!) *brevicaudatus*, Reichenbach, "Syst. Av. pl. xxxvii. fig. 2271—2." *Nectris brevicaudus*, Bonap., Consp., Av. ii. 1856, p. 201.

Habitat. "Found in all the Australia seas, and breeds in the greatest abundance on several of the islands in Bass's straits." [Gould.]

"Blackish fuliginous, lighter beneath; bill black, yellowish at the base; feet cinereous, their webs yellow." [Bonaparte.]

This is a species with which I am autoptically unacquainted, nor have I access to the original description and figure of Brandt, and I am therefore unable to discuss its characters and relationships. By Dr. Schlegel it is placed as a synonym, with a query of *N. tenuirostris*, but other authors all agree in considering it as a valid species.

PUFFINUS Brisson.

Bill about as long as the head, or a little less, about three-fourths the tarsus, rather stout, a little higher than broad at the base, compressed for the rest of its length; the unguis strong, much hooked; nasal tubes about a fourth the length of the culmen, broad, depressed, obliquely truncated, the septum thick, the nostrils oval; wings long, pointed, first primary longest, surpassing the tail, which is lengthened and more or less rounded, of twelve rectrices. Feet very large and stout; tarsus compressed, as long as the middle toe and claw; outer toe about as long as the middle, but its claw much shorter and weaker; tip of inner claw not reaching the base of the middle one; claws strong, little curved, moderately acute, somewhat depressed, the middle one with its inner edge dilated; hallux extremely abbreviated, only apparent as a short, stout, conical, rather obtuse claw. Of moderate and small size. Bicolor: bill and a portion of the feet usually dark colored.

The genus *Puffinus*, as characterized in the above paragraph, comprises numerous bicolor species, spread all over the world. They form two groups. Those of the first group are large, with robust bills, and have the upper plumage brown or cinereous. They are *major*, *leucomelas*, *Kuhlii* and *creatopus*, which compose the "genus" *Ardenna*, Reich. The species of the second group are all much smaller, with very slender, weak bills, and the upper parts blackish or greyish black. They are *anglorum*, *yelcuanus*, *obscurus*, *opisthomelas* and *nugax*, forming the restricted "subgenus" *Puffinus*.

PUFFINUS KUHLII, (Boie.)

Procellaria puffinus, "Linn.," Temminck, Manuel d'Ornith., ii. 1820, p. 805. Vieillot, Fauna Franç, 1828, p. 404, et auct. al. aliq. sed non Linnæi, quae certè *P. anglorum*, Ray.

Procellaria cinerea, Kuhl, Mon. Proc. Beit. Zool. p. 148, pl. ix. fig. 12; ex oc. Atlantico Schlegel, Mon. Proc. Mus. Pays-Bas, 1863, p. 24; ex ocean. Atlant. Sed *non* Gmelini, vel Lathami quæ certè *Adamastor typus*, Bp. est, ut benè et sæpè vindicata est a Bonaparteo; ex maribus antarcticis præcip, Pacif.

Puffinus cinereus, Cuvier, Temminck, Man. Orn., vol. iv., 1840, p. 506. Degland, Ornith. Europ. ii. 1849, p. 362, et al. script. Europ. recent. ferè omnium. Sed non Auduboni, et auct Amer. qui *P. major*, Faber: non Lawrencii, qui *Adamastor cinereus* hujus opusculi. *Nectris cinereus*, Keys. et Blas. Wirb. Europ. 1840, p. xciv.

Procellaria Kuhlii, Boie, Isis von Oken, 1835, p. 257, sp. 25. *Puffinus Kuhlii*, Bonaparte, Consp. Av. ii. 1856, p. 202. (Sed non Cassin, Pr. A. N. S. Philada., 1862, p. 327, quæ *Adamastor cinereus*, mihi, testibus speciminibus ipsis.)

Discussion of Synonymy.—There is in the Atlantic Ocean a very common and well known Procellaridian, to wit, the "cinereous Shearwater," a bird about the size of *Puffinus major*, Faber, but otherwise quite distinct from it in form, color, etc. This bird was named *Procellaria Kuhlii* by Prof. Boie, in 1835. (Isis von Oken, p. 257, sp. 25, which consult.) From Boie's excellent characterization, and from the very marked distinctive features of the bird itself, there need have been no confusion or uncertainty regarding it. But before 1835, so common and well known was the bird, that it had been noticed by numerous other writers, and unfortunately most of them had erroneously applied to it Gmelin's name *cinerea*; while others had with equal inaccuracy called it *P. puffinus*, Linnæus. When more recently C. L. Bonaparte attempted to show that "*cinereus*, Gm., Lath.," was not the common Atlantic bird at all, but a Pacific species, (described as *P. haesitata* by Forster) and properly the type of a genus (viz., *Adamastor*, Bp.) distinct from *Puffinus*; the assertion was illy received by ornithologists, and the general confusion rather augmented than diminished. To the following attempt to unravel the knotty points of synonymy involved, I would invite the particular attention of ornithologists, as I hope to be able to sustain the position assumed by Bonaparte.

The following is Gmelin's diagnosis, in copying which the italics are my own: S. N. i. pars ii. p. 563, sp. 17. "Pr. *cinerea, subtus alba*, cauda nigra, *rostro flavicante, pedibus cærulescentibus*. "Cinereous Fulmar," Latham, Syn. iii. p 405, No. 10. *Habitat intra circulum antarcticum*; glacialis magnitudine: 20¼ pollices longa." It will be noticed that Gmelin's bird is one from the Antarctic seas, as large as the common Fulmar, and with exactly the characters of the bird afterwards designated as *Adamastor typus* by Bonaparte. Gmelin's further description will be found to confirm this opinion by each of its sentences. I do not see, therefore, how it is possible to consider it as referring to a North Atlantic species, with characters so very different as are those presented by *P. Kuhlii*, Boie.

The *Proc. cinerea*, Lath., Ind. Ornith., ii. 1790, p. 824, and the *Proc. cinerea*, Vieillot, Nouv. Dict. D'H. N. 1817, xxv, p. 418, are both exactly the same as Gmelin's *cinerea*, and so is the *Puffinus cinereus* of Lawrence, Bds. N. A., 1858, p. 835, from the Pacific Ocean, under which head the synonyms of *Adamastor typus* are accurately enumerated.

The above is all that is necessary to be said, I think, to substantiate Bonaparte's position, that *P. cinereus*, Gm., is not the Atlantic bird afterwards named *Kuhlii* by Boie. The subject will be resumed and the generic and specific characters of *Adamastor typus*, as distinguished from those of *Puffinus Kuhlii*, will be enlarged upon in another place. It now only remains to discuss the various synonyms of *Kuhlii*.

The first instance of the misapplication of Gmelin's name, *cinereus*, which I have been able to find, is that by Cuvier, when he calls *P. Kuhlii* "*P. cinereus*." This same malidentification has also been committed by Bonaparte, (Comp. List, Bds. N. A. and Eur., 1838, p. 64.) Degland, (Ornith. Europ., 1849, ii. p. 362;) Temminck, (Man. Orn., iv. 1840, p. 506; Schinz,) (Europ. Faun., 1840. i. p. 393;) Schlegel, (Rev. Crit. Ois. Eur., 1844, p. 132;) Keyserling and Blasius, (Wirb. Europ., 1840, p. 94.)

The *Puffinus cinereus* of Bonaparte (Synop. Bds. N. A., 1828, p. 370,) of Nuttall, (Man. Ornith., ii. p. 334,) and of Audubon's works, (Orn. Biogr. vol. iii. p. 555; Bds. N. Amer., vii. 1844, p. 212, pl. 456,) is, however, not the *P. Kuhlii* but the *P. major*, Faber.

"The *Procellaria puffinus*, L.," of Temminck, (Man. Orn. 1820, ii. p, 805;) and of Vieillot, (Fauna Franç, 1828, p. 404) are synonyms of *P. Kuhlii*.

Yet another improper reference of Gmelin's *cinereus* is found in Degland's Ornithologie Europèene, where it is placed as a synonym (with a query, however,) of *P. major*, Faber. This is just the mistake which has been generally committed by American Authors.

I am enabled to state positively, from autoptical examination of the specimens themselves, that the bird referred to by Cassin, in the Proceedings of the Philadelphia Academy for June, 1862, page 327, as *Puffinus Kuhlii*, is really the *Adamastor cinereus*, Mihi. The specimens, three in number, collected by the North Pacific Exploring Expedition, are lying before me, and agree in the minutest particulars with the type specimen of Lawrence's *P. hæsitata*, (Ann. N. Y., Lyc. N. H., 1853) which is also Lawrence's *P. cinereus* (Birds Amer., 1858, p. 835,) which is *Adamastor typus*, Bp.

Description. In general *form* not unlike *P. major*, but rather more graceful, with slightly slenderer and weaker bill, comparatively longer wings and tail, etc. Bill scarcely if at all shorter than the head, just equal to the tarsus, moderately stout, compressed, higher than broad at the base; unguis only moderately strong and hooked; commissure and outline of inferior mandibular rami a little curved, the former most so; nasal tubes unusually abbreviated, measuring not over a fifth of the culmen, but elevated, inflated, medianly subcarinate, apically obliquely truncated, the nostrils subcircular in outline; wings moderately long, a little exceeding the tail; tail quite long, so much rounded as to be almost cuneiform, the central rectrices much elongated ; feet rather weak and slender, moderately compressed ; tarsus shorter than the middle toe without the claw ; outer toe and claw longer than the middle with its claw, tip of inner claw about reaching base of middle one ; claws obtuse, little arched, more or less dilated on their inner edge.

Colors. The upper parts are of a light smoky gray, or very light brownish ash color, this color uniform on the crown and nape, interrupted on the back by the pure or grayish white margins of all the feathers, which margins are broadest on the scapulars, deepening on the wing coverts and tertials into deep grayish brown, and also losing the white margins. The rump is concolor with the rest of the back, but the upper tail coverts have successively more and more white until the longest and most posterior ones are almost wholly of this color, with only some central touches of grayish brown. The primaries are deep grayish or brownish black, with, however, large white spaces which occupy the basal half or two-thirds of their inner webs. The outer webs, and apices of the secondaries are deep grayish plumbeons ; the greater part of their inner webs white. The entire parts of the bird, from the chin to the extreme tips of the under tail coverts are pure white, except some slight soupçons of grayish on the flanks. The under surfaces of the wings, except just along the edges, and the axillary feathers are pure white. The connection of the color of the upper parts with the white of the under, on the sides of the head and neck, is peculiar ; there is no line of demarcation whatever, but as the color of the upper parts becomes lighter in tint, so it becomes gradually more and more nebulated and undulated with white, the admixture of the two having a marked and beautiful effect. The under eyelid is wholly white, the upper less completely so. The bill is yellowish, darker along the culmen, the unguis light horn color. The legs and feet are yellowish, the webs still clearer yellow ; the claws flesh colored.

Dimensions.—Length of bill along culmen 1·90, along gape 2·60, from feathers on side of lower mandible to its apex 1·75 ; height at base ·70 ; width ·60 ; tarsus 1 90 ; middle toe and claw 2·50, outer do. 2·55, inner do. 2·50 ; wing from the carpus 12·75 ; central rectrices 5·50, exterior do 4·75.

The variations in size to which this species is subject, are entirely parallel with those of *P major*, detailed further on. The color of adult birds does not vary much, and that chiefly in the slightly different degree of clearness or obscurity of the upper parts. Younger birds, however, have the bill rather dusky than yellowish, and somewhat of a greenish or bluish tinge in the color of the feet. The upper parts are considerably darker than those of the adults, being rather more of a brownish plumbeous than of an ashy grayish tint.

PUFFINUS LEUCOMELAS Bp. ex Temm.

Procellaria leucomelas, Temminck, Planches colorées, No. 587.—Temm. et Schlegel, Fauna Japon. p, 131, fig. 85. Schlegel, Mon. Proc. Mus. Pays-Bas, 1863, p. 24. *Thiellus* sive *Nectris leucomelas*, Auct. aliq. *Puffinus leucomelas*, Bonap., Consp. Av. ii. 1856, p. 203.

With this species I am autoptically unacquainted, and therefore compile the following brief account from Dr. Schlegel's excellent Monograph, above quoted.

It is in general similar to *P. Kuhlii*, which it appears to replace in the Pacific Ocean. It is smaller, however, than that species, slenderer in general prorortions, and with a weaker bill. In color it is principally distinguished by having the feathers of the upper parts generally, and of the sides of the head and neck white, each with a brown longitudinal shaft line.

Length of wing from the carpus from 11¼ to 12 inches. Middle tail feathers 4½ to 4¾ inches, external 3⅓ to 3½. Bill 22 to 23 lines ; height at base 5 to 6 lines ; width about the same. Nasal tubes 3½ lines. Tarsus 21 lines ; middle toe 23 to 25 lines.

Habitat.—Pacific ocean, particularly in vicinity of Japan.

Puffinus creatopus Cooper (MSS.) Nov. Sp.

Diagnosis. *P. Puffini majoris* staturâ, nec ei coloribus perdissimilis; sed rostro multo breviore, crassiore, tubulis nasalibus inflatis; ferè omnino nisi ungue flavescente-carneo; pedibus brevioribus, gracilioribus, carneis; tectricibus caudæ superioribus et inferioribus ex toto brunneo-nigris; remigibus primariis spatio albo basin versûs interni pogonii carentibus.

Habitat.—South Pacific Coast of North America.

Specimen typicum et unicum in musæo Smithsoniano, (Catal. No. 31964,) ex insulâ "San Nicholas" prope Californiâ, a Chirurgio J. G. Coopero collectum. (Calend Julii A. D. mdccclxiii.)

Description.—*Form:*—Bill a little shorter than the head or tarsus, about two-thirds the middle toe and claw; the most robust of the Puffineæ, being especially large and swollen at the base, where it is as wide as high. The culmen rises rapidly from the end of the nasal tubes to the strong, very convex and much curved unguis; the sides of the bill are considerably compressed beyond the nostrils. Commissure curved from the feathers to the unguis, the convexity looking downwards; outline of the inferior mandibular rami about straight. The basal tubes are very short, being hardly a fourth of the length of culmen; they are unusually elevated, turgid, and with a slight median furrow; very obliquely terminated; the nares are elliptical in outline. The feathers of the forhead run forward to form an acute angle on the median line. The tarsi are unusually weak and slender, though not very much compressed, and are shorter than the middle toe without the claw. The outer toe just barely exceeds the middle, but its claw is much shorter and weaker. The tip of the inner claw falls short of the base of the middle one. The wings are of the ordinary shape and dimensions, and have the usual proportionate length of the primaries. The tail is of much the same length and has the same amount of graduation of its lateral rectrices as in *P. major.*

Color.—The upper parts are of about the same shade of brown as in *P. major*, and the feathers have similar lighter margins, the head, however, having more decidedly a plumbeous cast. The upper tail coverts are entirely deep brownish-black, darker even than the rest of the upper parts, with no vestige of white. The inner webs of the primaries are entirely brownish-black to their very bases, with no indication of the white spaces which exist in *P. major.* On the sides of the head and neck, the color of the upper parts extends entirely round on to the chin and throat, having no distinct line of demarcation, but very gradually and insensibly becoming more and more mottled with white, until the latter becomes the predominating color; on the chin the plumbeous-black and the white are about equal in amount. The dark color does not extend further nor indeed so far on the sides of the breast as on the sides of the neck. The lower eyelid is pure white. The sides under the wings and the inferior surfaces of the wings are mottled with grayish-black and white in about equal amount. The long axillary feathers are entirely grayish-black, except just at their bases. The middle of the abdomen and the circumanal region are variegated with grayish-black and white. The under tail coverts are entirely fuliginous black, with somewhat of a grayish cast. The nasal tubes, the culmen and unguis of the bill are brownish-black; the rest of the bill light-yellowish flesh color. The legs and feet are entirely light flesh color. The claws are whitish with brown tips.

Dimensions.—"Length 19·00; extent of wings 45·00" (collector's label.) Bill along culmen 1·60; along gape 2·30; from feathers on side of lower mandible 1·50; height at base, ·60; width about the same; length of nasal tubes ·40. Wing from the flexure 12·50. Tail: exterior feathers 4·00, median 5·00; tarsus 2·10; middle toe and claw 2·65; outer do 2·50, inner do 2·10.

Comparison with allied species.—The present species is so very peculiar in most of its features, that it intimately resembles no other with which I am acquainted. It may be well, however, to notice the points of difference between it and *P. major* which is the most nearly allied species. There is but little difference in size between the two birds, *creatopus* being only slightly smaller, and the color of the upper parts is about the same in each. *Creatopus* may be at once recognized as follows: by its much shorter, stouter bill, usually turgid and thick at the base, with its very short swollen nasal tubes, and light flesh-color, except along the culmen and unguis; by its shorter, slenderer flesh-colored feet; by its entirely brownish-black upper tail coverts; by the extension of the dark color of the sides of the head and neck far round on the chin and throat without any distinct line of demarcation; by the absence of any white at the bases of the primaries, and by the unusual amount of grayish-black mottling on the sides, the under surfaces of the wings, the axillary feathers, and circumanal region.

The shape of the bill is more like that of the common Atlantic *Kuhlii*; and the nasal tubes are quite as short. But the bill of *creatopus* is much stouter, wider and more turgid at the base, and the unguis is much more rapidly decurved. The color is quite different, (compare descriptions.) The legs of *cinereus* are yellow; of *creatopus* light flesh-color. The differences in plumage are too obvious to require comparison; e. g. *cinereus* has pure white under tail coverts; *creatopus* brownish-black, etc.

I have been unable to find any description which can be considered as indicative of this species, which I believe to be hitherto quite unknown. It is exceedingly interesting, from its many peculiarities of form and color. It is particularly to be noted, that it is the only "bicolor" species, that is, dark colored above and mostly white beneath, which has flesh-colored legs; this coloration of the legs being hitherto only known to its extent among the fuliginous species composing the subgenus *Nectris*.

The type and only known specimen of the species was taken by Dr. J. G. Cooper, at San Nicholas Island, off the coast of California. Its precise range of habitat is as yet unknown. Accompanying the specimen was a note from Dr. Cooper, stating that it was a species unknown to him and probably new, and suggesting, in the latter event, the exceedingly appropriate name by which I have designated it.

PUFFINUS MAJOR Faber.

Procellaria puffinus, Kuhl, Monog. Proc. Beit. Zool, 1823, p. 146, pl. xi, fig. 10; et auct. al. aliq.; sed non Linn., Gmel., Lath., quæ *Puff. anglorum* Ray; nec Temm. quæ *Proc. cinerea* Cuv. (*Kuhlii* Boie.)

Puffinus major, Faber, Prod. Isl. Orn. 1822, p. 56. Bp. Consp. Av. 1856, ii. p. 203.—Lawrence, Birds N. A. 1858, p. 833.—*Procellaria major*, Schlegel, Mon. Proc. Mus. Pays-Bas, 1862, p. 27.—*Ardenna major*, Reichenbach, Syst. av. t. xiv, fig. 770.

Puffinus cinereus, Bonap. Syn. Bds. N. A. 1828, p. 370, No. 311. Audub. Birds Amer. 1844, vii. p. 212, pl. 456; et al. script. Americ; sed non Gmel.

Habitat.—Atlantic Ocean, especially its northern and temperate portion. Mediterranean Sea. Atlantic coast of Africa. Cape of Good Hope. Terra del Fuego. Not the Pacific Ocean?

Synonymy.—This species has been presented under a variety of designations. Some authors have thought with Kuhl, that it is the one referred to by Linnæus, Gmelin and Latham, under the name of *Procellaria puffinus*. Elsewhere, however, I have proven, I think, that such is not the case, but that *P. puffinus*, Linn., is a synonym of *P. anglorum* Ray.

The *Procellaria puffinus* of Temminck (loc. cit.) is not this species, nor yet the *anglorum* (although he presents it as the real Linnæan *P. puffinus*;) but on the contrary, it is the *P. Kuhlii*, Boie, as is evident from the description and the synonyms quoted. I am quite at a loss, however, to discover upon what grounds Temminck asserts that the *P. puffinus*, Kuhl., and the *P. cinerea* Kuhl, are "le vieux et le jeune de la même espèce." Kuhl's descriptions certainly indicate the two different species; and his passable figures of their heads are distinct enough from each other. But if Temminck could stoutly maintain to the last that *P. fuliginosus*, Strickl., was the female of *P. major*, Fab. (!), it is the less to be wondered at that he should commit the error we are now discussing.

It is a little doubtful what species is referred to by Vieillot, Nouv. Dict. d'H. N. xxv, 1817, p. 421, under the name of "Le Pétrel-puffin, *Procellaria puffinus*, Lath." The dimensions given ("quinze pouces") appertain best to the *anglorum*; but the description is entirely that of the *P. Kuhlii*, which it is doubtless best to consider it. The *Procellaria puffinus* of Vieillot's Fauna Franç. 1828, p. 404, is undoubtedly the true *cinereus*.

Dr. Degland in his Ornithologie Européene, p. 363, gives a good description of this species under its proper name of *Puff. major*, but he is in error in citing as synonyms the *Puffinus cinereus*, Brisson, or the *Procellaria cinerea* Gmelin and Latham.

Description.—Form: Bill but very little shorter than the head or tarsus, stout and subterete at the base, then gradually more and more compressed to the strong, deep, much curved unguis. Nasal tubes straight, about a fourth the length of the culmen, somewhat dilated, the apertures widely separated, sub-elliptical. The culmen rises gradually with a slight but continuous concavity from the nostrils to the summit of the unguis. The commissure from the insertion of the feathers to the declination of the unguis is a long regular curve, whose convexity looks downwards. The outline of the inferior mandibular rami is nearly straight. The bill is about three times as long as it is high at the base, considerably less wide than high. The primaries are long, somewhat narrow, rather acutely pointed, the first longest, the second nearly equal, the rest rapidly graduated. The tail is long, being contained only about two and a third times in the wing from the carpus; so much rounded as to be almost cuneiform; the central rectrices projecting considerably, and the lateral being much abbreviated. The tarsus is as long as the middle toe alone, compressed as usual, but very stout and strong. The outer toe is as long or slightly longer than the middle, but the small size of its claw makes it fall short of the tip of the middle claw. The inner toe is unusually abbreviated, the tip of its claw falling far short of the base of the middle one.

Color.—Upper parts dark bistre brown; on the head inclining a little to plumbeous or grayish brown; on the tertials and rump the deepest; each feather of the back, rump, and wing coverts with a margin of lighter brown, which in freshly plumaged birds is so light as to be almost ashy white; on the head the color is uniform without any lighter margins, and it extends considerably below the eyes, just to the level of the gape, having a clear and distinct line of demarcation with the white of the throat. Posteriorly on the side of the neck the white reaches further round on the nape, and has a more indefinite outline. Backwards still on the sides of the breast, the dark color reaches farther down, encroaching on the white of that region. The upper tail coverts, especially the longest and most posterior ones, are mostly white, but with transverse rays or central spaces of brown. The primaries are brownish black, deepest on their outer webs; on their inner webs, towards their bases, gradually lightening till they become brownish white, or even nearly pure white, in freshly plumaged birds, especially on the innermost primaries. The under parts from chin to anus are white; this color interrupted on flanks by the more or less numerous, large, isolated, dark brown patches, which coalesce just over the flanks. The under surfaces of the wings are white, except just along their edges where they are mottled with brown; and the apices of the long axillary feathers are brownish. The under tail coverts are deep grayish brown, more or less conspicuously tipped with whitish. The tail feathers are like the outer primaries. The bill is deep blackish horn. The outside of the tibiæ and the exterior toe are brownish; the rest of the feet including the webs yellowish flesh color.

Dimensions.—Total length 18.00 to 20.00 inches and hundredths; expanse of wings 43.00 to 45.00. Bill along culmen 2.00; from feathers on side of lower mandible to tip 1.75; depth at base .65, width .60; wing from the carpus 13.00; tail: central feathers 5.75; exterior do. 4.75; difference 1.00; tarsus 2.40; middle toe and claw 2.90; outer do. 2.75; inner do. 2.30.

Variations.—The differences in dimensions which this large species presents are so great that the above measurements can only be considered as an average; and individuals will be found considerably above and below the standard. The bills of various specimens, as well as the tarsus and toes, differ to the amount of two or even three tenths of an inch; the wings from the carpus three-fourths of an inch, or more, and the tail proportionally. The relative proportions, however, and the shape of these several parts appear to be pretty constant.

There also exist greater variations in color than are found in most of the species. The difference appears to depend chiefly upon age, or rather upon the age of the feathers themselves. Just after the moult, when the feathers are fresh and new, they are of a clear deep brown with a considerable of a plumbeous tinge, and their margins are exceedingly light colored, in fact almost white on the tertiaries, etc. With advancing age the feathers become more and more of a duller brown, much like that given by Audubon in his plate; the margins are broader, less deeply defined, and simply of a dull grayish brown. Constant characters, however, seem to be the uniformity in color of the feathers of the head, there being no light margins to them; the peculiar line of demarcation on the sides of the head and neck, and the partially white upper, and almost wholly dark under tail coverts. Audubon's plate of this species, otherwise excellent, is very wrongly colored as regards the bill and feet. The bright tints he gives them rather appertain to another species.

Notwithstanding these variations, the present species is so marked a one that it is not readily to be confounded with any other. Some small and light colored specimens look something like examples of *P. Kuhlii;* the exact differences between the two will be given under the head of the latter. From *P. anglorum*, its size and the color of the upper parts at once distinguish it. *P. obscurus* and its allies are too different to require comparison. *P. major* may always be recognized by the peculiar size and shape of the bill (carefully examine preceding description); by the lighter margins of the feathers of the upper parts; by the line of demarcation of the white and brown on the sides of the head, as above given; and by the colors of the under tail coverts and flanks, which are the reverse of those of *Kuhlii*, its nearest ally. However light the color of the upper parts may be, they never acquire the real ashy tint which is a distinguishing characteristic of the latter species; and the colors of the bill and feet are always conspicuously different.

This species has an exceedingly extensive range. It apparently inhabits the entire Atlantic Ocean, up to exceedingly high latitudes. Dr. Schlegel has specimens from points on the west coast of Africa and from the Cape of of Good Hope. A specimen before me from Terra del Fuego, collected by Mr. T. R. Peale, Naturalist of the U. S. Exploring Expedition, is identical with the common north Atlantic bird.

PUFFINUS ANGLORUM, Temm. ex Ray.

Procellaria anglorum, Raii Syn. 1713, p. 134, sp. 4. Temminck, Man. Orn. ii. 1820, p. 806. Schlegel, Mus. Pays-Bas, 1863, p. 28. *Puffinus anglorum*, Brisson, Ornith., 1760, vi. p. 131. Temminck, Man. Ornith. iv. 1840, p. 509. Bp. Consp. av. 1856, ii. p. 203. Lawrence, Gen. Rep. Bds. N. Amer., 1858, p. 834; et auct. recent. ferè omnium. *Nectris anglorum*, Kuhl. Monog. Proc. Beit. Zool., 1820, p. 146, sp. 23.

Procellaria puffinus, Brünn., Orn. Bor., 1764, p. 29, sp. 119. Linn. Syst. Nat. i. 1766, p. 213; Gmel. S. N. i. 1788, p. 566. Lath. Ind. Orn. ii. 1790, p. 824; sed non auct. aliorum, quæ potius ad *Puff. majorem* spectat.) *Nectris puffinus*, Keys. et Blas. Wirb. Europ. i., 1840, p. 94.

Puffinus arcticus, Faber, Prod. Isl. Orn., 1822, p. 56, sp. 1. *Puffinus Baroli*, Bonelli; Bp. Consp. Av., 1856, ii. p. 204; (an = *P.* "*anglorum*, ex Mare Medit.;" an sub. *P. yelcuano* adducenda?) *P.* "*manksii*," aliq.

Habitat.—North Atlantic Ocean, at large.

This species, though so long known and so common, yet requires very careful investigation; both because its bibliography is somewhat extensive, and on account of its variations in size and color, which are so considerable that there has been much confusion concerning it. I will first examine into its synonymy, and then proceed to characterize the species beyond the probability of any further difficulty with its specific characters.

The *Procellaria puffinus* of Linnæus, Gmelin, and Latham, has been variously interpreted by modern authors. Most writers, including Kuhl and others, consider it as the bird which was afterwards named *P. major* by Faber. Temminck makes it equal to the *cinereus* of Gmelin. Bonaparte and Schlegel regard it as undoubtedly referring to the present species. An examination of the diagnoses of Linnæus, or Gmelin, or Latham,—particularly the latter,—will, I think, make it quite patent that the last is the only tenable view to take of the name. Such expressions as are found in e. g. Latham's notice, as "Pr. corpore suprà *nigro*, subtus albo" * * * "15 pollices longa," etc., can only be considered as referring to the *anglorum*; for they are totally at variance with the essential characters of the *P. major*. Moreover, Latham cites "*P. anglorum*, Raii, Syn." as a synonym of the species. Such being the case, I unhesitatingly accord with Bonaparte and Schlegel in their identification of the Linnæan *P. puffinus*. I am quite at a loss to understand upon what grounds M. Temminck makes the remark that "ni Linné ni Latham n'out connu cet oisean."

The first recognized classical notice of this species is that given in 1713 by Mr. Ray, under the name of *Proc. anglorum*. Brisson calls it *Puffinus anglorum*; it is indicated by Linnæus, Gmelin, and Latham as *Proc. puffinus*, with "*anglorum*, Ray," as a synonym. Temminck was, I believe, the first binomalist who adopted Ray's designation; he calling it in 1820 *Procellaria anglorum*; in 1840 *Puffinus anglorum*.

This species is also the *Proffinus arcticus*, Faber (l. c.), as is evident from his diagnosis. The reference of Faber's name *arcticus* to the *P. major*, as has been occasionally done, is quite erroneous. I have an indistinct recollection of having seen this species cited as *Procellaria* or *Puffinus* "*manksii*," but I cannot at present call to mind the reference.

A certain "*Puffinus Baroli*, Bonelli," is admitted as distinct by Bonaparte in his Conspectus, p. 204, and also in his Tab. Longip. in the Comptes Rendus. It is said to be somewhat smaller, lighter colored, and with a slenderer bill. Well acquainted as I am, however, with the variations in just these features which the *anglorum* frequently presents, I cannot discover sufficient grounds upon which to separate *P. Baroli* even as a distinct variety; but rather entirely agree with Dr. Schlegel in considering it as an undoubted synonym of *anglorum*, or at least of *P. yelcuanus*, which is the representative species in the Mediterranean Sea.

Bonaparte (Consp. ii. p. 203) inquires "quid *Proc. puffinus*, Kuhl, Mon. Proc. p. 146, sp. 22, t. xi., f. 10, ex Mediterraneo?" to which I would reply unhesitatingly that it is the *Puffinus major*, Faber. The description is entirely pertinent, and the figure much more readily recognizable as representing the head and bill of this species, than are many of the delineations of the work.

Description.—Form: —The bill, measured from the frontal feathers, is about three-fourths as long as the skull, rather more than two-thirds the tarsus. Its height at the base is just about equal to the width. Its height at the point of greatest convexity of the unguis hardly exceeds that at the middle of the culmen. The unguis is not very strong, its convexity only moderate. The commissure at first curves gently upwards, then still more gradually downwards for the whole length of the bill, and then is pretty strongly deflected along the edge of the unguis. The outline of the lower mandible is about straight to the unguis, a little concave thence to the tip. The length of the nasal tubes is a little less than a fourth that of the culmen. The outline of the feathers on the upper mandible is the segment of a perfect circle. The folded wings just about reach to the end of the tail. The second primary is nearly as long as the first, the rest successively more and more rapidly graduated. The tail is contained about two and a third times in the wing from the carpal joint. It is much rounded, the lateral rectrices all regularly graduated; the exterior just three-fourths of an inch shorter than the central pair. The tarsus is just as long as the middle toe without its claw. The external toe and claw is a little longer than the middle toe and claw. The tip of the inner claw falls short of the base of the middle one. The claws are all nearly or quite as broad as high, being much dilated on their inner edges.

Color:—The entire upper parts are of a deep lustrous black, with a soupçon of brownish, especially when the feathers are old and worn. On the front and sides of the head and neck the black has a grayish or plumbeous cast. This color extends on the sides of the head much below the eyes, in fact quite to the throat, but it is more or less marbled with white. The under eyelid is pure white, in marked contrast with the surrounding black. On the sides of the neck the white extends further round towards the nape; on the sides of the breast, on the contrary, the color of the back extends a considerable distance, it being of a decided greyish plumbeous hue, and gradually becoming more and more marbled with white till it entirely disappears. The primary quills are black, as are their shafts, their inner webs fading into dull grayish brown. The entire under parts, from chin to under tail coverts, are pure white, with the single exception of a few feathers just on the flanks, and of the outer webs of the exterior row of under tail coverts, which are plumbeous black. The under surfaces of the wings and the axillary feathers are pure white, with a slight marbling of blackish just along the bend of the wing. The caudal rectrices are like the primary quills; the inferior surfaces of their shafts grayish white. Bill deep greenish black, some part of the lower mandible yellowish. Part of outer side of tarsus, whole of outer side of exterior toe and the claws brownish black; rest of feet light yellowish, including the webs.

Average dimensions:—Bill along culmen 1.40; height at base .45; width about the same; along rictus 2.10; from feathers on side of lower mandible to its tip 1.40; wing from the carpal joint 9.25; tail: exterior feathers 3.25, middle 4.00; amount of graduation .75; tarsus 1.80; middle toe and claw 1.90; outer do. 2.00; inner do. 1.55. Total length about 14.00; extent of wings about 33.00

Variations.—As to dimensions, these are quite considerable. As usual among *Puffini*, the bill differs a good deal in absolute size, as well as in robustness, generally preserving its shape, however, quite contantly. The longest bill before me measured 1.50; the shortest 1.30, along culmen, with a corresponding difference in other dimensions. The wing from the carpal joint varies nearly half an inch, and the tail to a corresponding degree. The total length of tarsus and toes varies about a third of an inch. In color the species is more constant, the chief variation being in the greater intensity or more decided brownish tint of the black of the upper parts. Younger specimens have more marbling of the plumbeous black and white on the sides of the breast, the color sometimes reaching nearly or quite across the breast, or even invading the throat. In immature individuals, also, the lateral inferior caudal tectrices may be more extensively hued with plumbeous black. They are never, however, so much darkened as is usual in *obscurus* or *opisthomelas*.

This species may be always recognized among its congeners by the following combination of characters: its peculiar dimensions (see above), joined to the very dark upper parts, this color descending far on the sides of the head and breast, leaving a conspicuously white under eyelid; the almost entirely white under tail coverts and the comparative shortness and characteristic degree of roundness of the tail.

This is so very distinct, and at the same time so well known a species, that it hardly requires comparison with any other. The features in which the *P. yelcuanus* differs from it will be pointed out under the head of the latter.

PUFFINUS YELCUANUS, Bp. ex Acerb.

Procellaria yelkouan,* Acerbi, "Bibliot. Ital., 1827, cxl., Agost. p. 294;" et "Bull. des Sciences Nat., 1829, xvi. p. 463. Schlegel, Monog. Proc. Mus. Pays-Bas, 1863, p. 29. *Puffinus yelkouan*, Bonaparte, Comptes Rend. Tab. Longip. , Id. Consp. Av. ii. 1856, p. 205.

Habitat.—More eastern portions of the Mediterranean Sea; especially in the Black Sea, and in the vicinity of the Bosphorus.

With this species, admitted by the majority of modern authors, I am acquainted only through descriptions. This is specially to be regretted, since authors are at variance regarding its characters and affinities, and are not even entirely agreed upon its specific validity. Bonaparte considers it to be the representative of *obscurus* in the Black Sea and vicinity, and says that it is smaller than that species (being only 10 inches in length) and has a slenderer bill. Dr. Schlegel, on the contrary, considers it as most intimately allied to *anglorum*, which it replaces in that locality. As far as I can judge from a careful study of published descriptions, I entirely agree with Dr. Schlegel in opinion. On comparing it with *anglorum*, Dr. Schlegel has found it to differ as follows: In the greater elongation of the point of the wing; in the color of the upper parts being lighter and rather tending to grey than black, as is also the color of the dark feathers of the crissum; and in the uniform deep gray of the lateral under tail coverts, these latter being, in *anglorum*, black on their outer, and white on their inner webs.

The following detailed measurements are given by the same author, taken from individuals coming from the Bosphorus, near Constantinople. They are to be compared with those of *anglorum*, already given on a previous page. Wing (from the carpus), 8·33 to 8·66 inches and hundredths. Tail, 2·40 to 2·60. Bill along culmen, 1·20 to 1·50; height, ·28 to ·33; width, ·40. Nasal tubes, ·16 to ·20. Tarsus, 1·66 to 1·80; middle toe, 1·58.

PUFFINUS OBSCURUS, Vieill. ex Gmel.

Procellaria obscura, Gmel., Syst. Nat., i. pars ii. 1788, p. 559. Lath., Ind. Ornith., ii. 1790, p. 828, et auct. antiq. Vieillot, Nouv. Dict. H. N. 1817, xxv. p. 423. *Puffinus obscurus*, Bonap., Synop., 1828, p. 371. Vieillot, Gal. Ois., 1834, ii. p 230, pl. 292. Audub., Bds. Amer., 1844, vii. p. 216, pl. 458. et al, auct. recent. *Nectris obscura*, Kuhl, Beiträge Zool., 1820, p. 147, pl. xi. fig. 11. *Cymotomus obscurus*, Macgillivray, Man. Orn., 1844, ii. p.13. "*Puffinus l'herminieri*, Lesson," fide Bp. *Puffinus floridanus*, Musæi Beroliensis," fide Bp.

Habitat.—The warmer portions of the Atlantic Ocean, especially the Gulf of Mexico, and the coasts of the Southern United States; abundant in the Bahamas and Bermudas. Wanders as far north as New Jersey, and is accidentally found in Europe. Apparently replaced in the corresponding latitudes of the Pacific Ocean by my *Puffinus opisthomelas*.

For so long known a species, the present has remarkably few synonyms, and its bibliography is as explicit as that of almost any of the eighteenth century species of the family. First indicated with tolerable accuracy in Linnæan times, the species has almost invariably been presented under its original and proper specific title, though referred successively to the genera *Puffinus*, *Nectris*, and *Cymotomus*. The names "*l'herminieri*" of Lesson, and "*floridanus*" of the Berlin Museum, which I quote upon the authority of Bonaparte, are the only specific synonyms which I have met with.

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* I find this barbarous name variously spelled yelkouan, yelkuan, yelkoan, etc. I have seen fit to modify it insomuch that it may present somewhat of a classical aspect.

There is an unusual and remarkable discrepancy in the statements of various authors concerning the length of the species, different writers giving the dimension from as little as 9¾ inches to over 13. It is impossible that it should vary to this extent. I believe the average length is a little over eleven inches.

Audubon's description of this species is sufficiently pertinent, but the plate he gives is unusually poor, and by no means true to nature. The outline of the bill is exceedingly faulty; the line of demarcation of the dark and light colors along the side of the head and neck is by no means accurate, and the lower tail coverts are represented as entirely white. The exact insertion of the right tibia of the individual figured has always been to me, anatomically speaking, a puzzle.

Dr. Kuhl informs us, in the text, that figure 11 of plate ix. of his Monographie der Procellarien was intended as a representation of the bill of this species; which is fortunate, as otherwise it would be quite impossible so to identify it.

I am much surprised at the statement by Dr. Degland, (Ornithologie Européene, ii. page 366, published in 1849!) that "cette espèce est peu connue, et il n'est pas certain qu'elle est distincte de la précédente"—*P. anglorum!* This author's indication of the habitat of this species is vague, and leaves much to be desired.

M. Temminck (Man. Ornith., ii. p. 808) gives, under head of *P. obscurus*, an excellent description of this species, except that the dimensions are inaccurate, being far too small.* The exact measurements of both of Temminck's typical examples are given by Dr. Schlegel in his recent monograph of the Procellaridæ, (Mus. Pays-Bas, p. 30.) This author finds that one of the types is an example of *anglorum*, from the Mediterranean Sea, afterwards labelled by Temminck himself a *P. Baroli*, Bonelli; and that the other is a small, weak-billed specimen of the true *obscurus*, from the Atlantic Ocean. These facts, supported by the authority of one so well known for diagnostic acumen as Dr. Schlegel, are indicative of an imperfect acquaintance on the part of Temminck with the species he treats of under the name *obscurus*.

The species of *Puffinus* spoken of in a paper published by Dr. D. W. Prentiss and myself in the Annual Smithsonian Report for 1861, (p. 418, as having occurred at Washington, D. C., and doubtfully referred to as the *obscurus*, has since been definitely ascertained to be this species.

Description.—Form: The bill is rather small and weak, and considerably compressed, except just at the base. In length along the culmen it measures just about two-thirds the skull, and about three-fourths the tarsus. It is quite stout at the base, where the height very decidedly surpasses the width. The unguis rises rapidly and a little suddenly above the rest of the culmen, and is strongly convex in outline. The commissure, from the insertion of the feathers to the unguis, as well as the outline of the lower mandible as far as the unguis, is almost perfectly straight. The nasal tubes are short, being much less than a fourth the length of the culmen, but they are elevated and quite conspicuous, much more so than in *anglorum*. The wings barely reach, when folded, to the end of the long tail. The proportionate lengths of the primaries are the same as in most other species. The tarsus is just as long as the middle toe without its claw. The outer toe with its claw is just as long as the middle one with its claw. The top of the inner claw about reaches the base of the middle. The tail is very long, exceeding that of *anglorum*, which is a much larger species. It is also so very much graduated as to be almost cuneate, the lateral feathers being relatively shorter than in any other species. The under tail coverts are very long, fully equalling the central rectrices.

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* "Longueur, "à peupres 10 pouces."

Color.—The upper parts are of a hue quite different from that of *anglorum*, the black having every where a quite appreciable grayish or plumbeous tinge, and the borders of the feathers being still notably lighter, especially on the scapulars and tertials. The color is deepest on the rump and upper tail coverts; it is much restricted on the sides of the head and neck, not extending below the level of the eyes, and even there its borders are marbled with white. On the sides of the breast the dark color extends considerably more towards the median line, but it is of a very light plumbeous tint, and much variegated with white. *Both* eyelids are more or less white, and there is, moreover, an indication of a white superciliary streak. The remiges and rectrices are colored, as in *anglorum*. The under parts, from the chin *to* the under tail coverts, are white, as are the axillary feathers and inferior alar tectrices, the white only interfered with over the flanks by leaden black. The longest posterior under tail coverts are brownish black, as are also one or two rows of the exterior ones, the rest being white, with or without a plumbeous tint. Notice that in amount of white on the under tail coverts, *obscurus* is just intermediate between *anglorum* and my new *opisthomelas*. The bill is deep leaden blue, darker at the apex; the legs and feet colored, as in *anglorum*.

Dimensions.—Length of bill along culmen, 1·25; along rictus, 1·70; from end of nostrils to tip, ·90; from feathers on side of lower mandible to its apex, 1·20; its depth at base, ·40; width, ·35; depth at convexity of unguis, ·25. Wing, from the carpal joint, 8·00. Tarsus, 1·60; middle toe and claw, 1·80; outer do., 1·85. Central tail feathers, 4·25; exterior feathers nearly an inch shorter. Total length from tip of bill to end of tail about 11·00; expanse of wings about 25·50.

Variations.—I find the differences in size to be about the same, relatively to its dimensions, as in the other smaller *Puffini*, while, as usual, the general form and the proportion of parts are pretty constantly preserved. The characteristic hue of the upper parts is always recognizable, but the precise tint varies with the age of the feathers. The margins of the dorsal feathers are frequently very conspicuously lighter. The limit of the extent of the dark color on the sides of the head, neck, and breast, hardly differs notably, even with age, and is a strong specific character. The relative amount of the black and white on the under tail coverts is also pretty constant, being intermediate between *anglorum* and *opisthomelas*, as before stated. The unusual graduation of the tail is, I believe, always preserved in mature birds.

The combination in this species of its small size, the tint of the upper parts, and its characteristic line of demarcation with the white on the sides of the head, neck, and breast, together with the color of the under tail coverts, and the length and shape of the tail, renders it readily diagnosticable. As with *anglorum*, I have taken it as the standard in treating of the other closely allied; and the peculiar points wherein each differs from it will be found detailed under their respective headings.

PUFFINUS OPISTHOMELAS Coues, nov. sp.

Diag.—*P. Puffino obscuro* nec perdissimilis; sed major, rostro longiore, robustiore, alis pedibusque longioribus, caudâ breviore, minus rotundata; et tectricibus caudæ inferioribus ferè omnino fuliginoso-nigris.

Habitat.—South Pacific coast of North America.

Description.—Form: The bill is rather long, about four-fifths the tarsus, stout, moderately compressed, a very little higher than broad at the base, the unguis large and strong, its convexity great, and rising much above the level of the rest of the culmen, the depth of the bill at the point of the greatest convexity of the unguis being much more than in its middle. The outline of the inferior mandibular rami is about straight as far as the unguis; the line of the commissure is considerably curved. The nasal tubes are large and prominent, and rather long for this group, being more than a fourth of the culmen; and the nasal apertures are much elongated, being very elliptical rather than circular. The frontal feathers extend forwards to a point on the median line instead of being the segment of a perfect circle, as in *anglorum* and *obscurus*. The folded wings reach beyond the tail. The tail is comparatively and absolutely much shorter than in *obscurus* and very decidedly less rounded, the difference between the middle and exterior rectrices being only about half an inch. The feet are as much longer than those of *obscurus* as is proportional to the greater size of the bird; the tarsus is as long as the middle toe and half its claw. The outer toe and claw equals the middle; the tip of the inner claw falls short of the base of the middle one.

Color.—The nasal tubes and culmen are blackish, the sides of the bill yellowish or reddish brown, the unguis mostly light bluish white. "The iris is dark brown," (collector's label.) The internal aspect, and part of the outer side of the tarsus, the middle and inner toes and the webs are light yellowish flesh color. The rest of the tarsus, the outer toe and the very margins of the webs are brownish black. The claws are brown. The entire upper parts, the wings and tail are of exactly the same shade of sooty black as obtains in *obscurus*, but with the following notable difference in the line of demarcation of the white on the sides of the head, neck and breast: the dark color is much more extensive, reaching as far below the eyes as it does in *anglorum*, and there is no definite union of the two colors; but as the dark takes on more and more of a lighter plumbeous hue, it insensibly becomes more and more nebulated with white. There is no white on either eyelid, nor any indication of a white superciliary line. The under wing coverts are white, as in *obscurus*; the bend of the wing rather more decidedly mottled with the color of the back. The axillary feathers are more or less blackish towards their ends instead of being pure white. The flanks are more extensively and decidedly fuliginous black than in *obscurus*. It is in the color of the under tail coverts, however, that the difference from *obscurus* is most apparent. These feathers are entirely of a deep fuliginous black, except a few of the shortest ones just posterior to the fundament, which are whitish.

Dimensions.—Bill along culmen 1·40, along commissure 2·00, from end of nasal tubes to tip 1·05, from feathers on side of lower mandible to its tip 1·40; height at base ·42, width a little less; height at convexity of unguis ·32. Wing from the carpus about 9·00. Tarsus 1·80; middle toe and claw 2·10. Tail 3·75; outer feathers ·60 shorter; (in *obscurus* tail 4·25; outer feathers nearly 1·00 shorter.)

Variations.—With but two specimens before me, I cannot speak so fully on this point as I could wish; but the variations are doubtless quite parallel in all respects with those of *anglorum* or *obscurus*. The above measurements indicate the average of the two specimens. They are precisely similar in colors.

Comparison with allied species.—This new species differs from *obscurus* as follows, briefly: In its larger size, as will be palpable from the measurements given of the bill, wings and feet.* In its both relatively and absolutely *shorter* tail, which is also much less rounded. In the different outline of the frontal feathers on the bill In the different coloration, insomuch that there is no white about the eye; that the dark color extends much further on the sides of the head and neck; and that the under tail coverts are almost entirely fuliginous black, instead of being for the most part white.

It is distinguishable at a glance from *anglorum* by its greatly inferior size,—

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* The collector's label gives, "Total length 15 inches; expanse of wing 32;" but these cannot be implicitly relied on.

vide measurements ; by the very different color of the upper parts ; and by the fuliginous black instead of white under tail coverts.

The *Puffinus yelcuanus* is lighter colored above than is *anglorum*, and therefore this species approaches it in this respect. But *yelcuanus* is much larger than the present species, and has white under tail coverts like *anglorum* ; so that it is impossible to confound it with *opisthomelas.*

Still more different is this species from the *P. nugax*, Solander, from the Australian seas. This latter is a very diminutive species, much smaller even than *obscurus*, the wing being only about 6½ inches from the carpus. It also has the white of the throat extending far up on the sides of the head and neck, and white under tail coverts ; characters diametrically opposed to those which obtain in the present species.

I am acquainted with no other species to which the present bears any sort of resemblance. I trust that I have so fully and correctly indicated its characters and relationships, that its introduction, even into this peculiarly intricate group, will be the cause of no confusion or uncertainty regarding it.

Two fine examples are contained in the Smithsonian Museum, both collected by Mr. John Xantus at Cape St. Lucas, Lower California. (Smiths. Catalogue, Nos. 16,990, 16,991.)

PUFFINUS NUGAX (Solander.)

Procellaria nugax, Solander, Schlegel, Mon. Proc. Mus. Pays-Bas, 1863, p. 31. *Puffinus nugax*, Bonaparte, Consp. Av., ii. 1856, p. 205.

Puffinus assimilis, Gould, P. Z. S., 1837, v. p. 156. Id. Ann. et Mag. N. H. xvi. Id. Birds Aust., vii. pl. 56.

"*Procellaria australis*, Eyton," (Bp.)

Habitat.—Australian seas.

A fine suite of this well-marked species is in the collection of the Philadelphia Academy. Its relationships are closest with *P. obscurus*, but the differences are sufficiently obvious on comparison. It is the very smallest known species of *Puffinus*, being appreciably less than the *obscurus*. It is hardly 10·50 inches in length ; the wings from the carpus only about 6½ ; th tail averages 2·75 ; the bill about one inch ; the tarsus 1¼ ; the middle toe about the same. The color of the upper parts is about the same as in *P. obscurus*, or a very little lighter ; the feathers generally with appreciably darker tips. A striking diagnostic feature is found in the extent to which the white of the under parts mounts up on the sides of the head and neck, which is greater than in any other species. The inferior caudal tectrices are usually entirely pure white. The under surfaces of the wings are pure white, and the inferior aspect of the inner webs of the primaries are dull whitish, being much lighter than are these parts in *obscurus*. The bill is dusky horn color. The tarsi are greeenish yellow ; the webs bright chrome yellow.

The preceding paragraph shows the points in which the species differs from *obscurus*. It is too distinct from *anglorum* or *yelcuanus* to require comparison. It cannot be confounded with my *P. opisthomelas*, since the latter is nearly as much larger than *obscurus* as *nugax* is smaller ; has the coloration of the sides of the head and neck very different, (compare descriptions ;) has black instead of white under tail coverts, etc.

I have not an opportunity of examining the original description of *nugax* by Solander, but all authors agree that it is the species subsequently named *assimilis* by Gould. I do not know where the species is called *australis* by Eyton, but quote the name on the authority of Bonaparte.

Analytical Synopsis of the Genera and Species of PUFFINEÆ.

Family *PROCELLARIDÆ*.

Subfamily PROCELLARINÆ.

Section PUFFINEÆ.

Char.—Tail of twelve much graduated feathers. Bill long, compressed, much hooked, the outline of the unguis of the lower mandible concave, decurved. Nasal tubes short, broad, flattened, apically usually very obliquely truncated; in length usually a fourth of culmen; the internasal septum broad. In color either entirely fuliginous, or cinereous, or brown above and white beneath; never glaucous or bluish, or with parti-colored primaries. "Shearwaters."

I. MAJAQUEUS Reich.

The very short tail only a fifth of the total length. Bill unusually stout for this section; nasal tubes approaching in character those of Fulmareæ. Very large; fuliginous, with peculiar facial markings.

1. M. ÆQUINOCTIALIS Reich.

Pr. æquin. L. *Priofinus æquin.* Homb. et Jacq. *Pr. nigra*, Forst. *Puff. capitis bonæ-spei*, Briss.

Tarsus 2¼ inches; ungues of bill yellow; a submental white spot.

2. M. CONSPICILLATUS Bp.

Proc. conspicillatus, Gould. *Pr. larvata*, Less.

Larger; bill more robust; its unguis bluish black; tarsus 2⅓; usually a white submental spot; a lateral stripe on sides of head, and a transverse one across the vertex before the eyes.

II. ADAMASTOR Bp.

Bill and nasal tubes identical with those of *Majaqueus*. Tarsus much less than middle toe without claw. Tail very short, much graduated. Bi-color; above cinereous, below white.

3. A. CINEREUS Coues.

Proc. cinerea, Gm. (non Cuv., Kuhl., Temm., Schleg., Degl., Schinz., Keys. et Blas. quæ *Puff. Kuhlii*, Boie; nec Aud., Mitt. quæ *Puff. major*, Fab.) *Puff. cinereus*, Lawrence, 1858. *Adamastor cinereus*, Coues, 1864. *Proc. hæsitata*, Forst., Gould, Reich. (non Kuhl, Temm., Newton, quæ *Astrelata diabolica*) = *Puffinus hæsitata*, Lawr., 1853. *Puff. Kuhlii*, Cass. [1862] nec Boie. *Proc. adamastor*, Schleg. *Adam. typus*, Bp.

Bill yellow, nasal tubes, culmen and sulcus on lower mandible black; above with under surface of wings and tail cinereous; below white; 19 inches long; bill 1·80, wing 13·00, tail 5·75, tarsus 2·40, middle toe and claw 2·90.

4. A. GELIDUS Coues.

Proc. gelida, Gm., Lath., Vieill. *Proc. flavirostris*, Gould. *Adamastor flavir*, Bp.

Above brown, with paler edges to the feathers; wings and tail deep blackish brown; below, including the under surfaces of wing and tail, white, the feathers of the former with a brown longitudinal streak; bill yellow, its tip dark; 19 inches long, wing 15, tail 6·50, middle toe and claw 3·15.

5. A. SERICEUS Bp.

Puff. sericeus, Lesson.

Bill black; above grayish ash, deeper on the wing coverts; below white; 15 inches long, wing 11·50, tail 5, tarsus 1·75, middle toe 1·33.

III. THIELLUS Gloger.

Generally like *Nectris*, but tail unusually long and cuneiform, being nearly or quite half as long as the wing from the carpus.

6. T. SPHENURUS Bp.

Bill flesh color, tinged with brown, darker on culmen and unguis. Length 15 to 16 inches, wings about 11, bill 1·60.

7. T. CHLORORHYNCHUS Bp.

Bill greenish orange, black on culmen and at tip. Bill 1·85; stouter than in *sphenurus*, a little larger than that species, but the wing usually shorter, (½ inch or more.)

IV. NECTRIS Bp. (emend. Forst.)

Size moderate; unicolor, fuliginous; feet pale; bill long, slender, much hooked; nasal tubes short, flat, very obliquely truncated; tail long, rounded; tarsus about equal to middle toe without claw, (vix nisi colore fuliginoso genere *Puffino* differre videtur!)

8. N. FULIGINOSUS Keys. et Blas.

Puff. fuliginosus, Strickl. et auct. (sed non *Proc. fuliginosus*, Gm., Lath., Vieill., quæ species "*Thalassio*;" nec Banks, [tab. 19;] nec Kuhl, [sp. 12] quæ *Pterodroma atlantica*, Gould.) *Puffinus major* fœm! Temm. *Puff. cinereus* fœm! Gould.

Bill concolor with plumage; feet brownish black, internal face of tarsus and the webs dusky yellowish. Length 18 inches, wing 12, bill 2·00. North Atlantic.

9. N. AMAUROSOMA Coues, nov. sp.

Bill concolor with plumage; feet fleshy white, outer side of tarsus and outer toe tinged with dusky; inferior wing coverts mostly white; wing 11 inches, tail 4·25, bill 1·70. Pacific coast of N. Amer.

10. N. CARNEIPES Bp.

Puff. carneipes, Gould. *Proc. carneipes*, Schlegel. *Majaqueus carneipes*, Reich. "*Puff. cinereus*, juv. Smith." "*Nectris gama*, Bp.".

Bill fleshy white, culmen and tips dusky; legs, feet and membranes yellowish flesh color. Length 15 inches; length of bill, feet, wings, tail, much the same as *fuliginosus*. Australian seas.

11. N. TENUIROSTRIS Bp.

Proc. tenuirostris, Temm. *Puff. tenuirostris*, Temm. et Schleg. "*P. curilicus*, *P. tristis*, Mussæorum."

Very small; bill excessively weak and slender; wing 10 inches, tail 3·50, bill 1·20, tarsus 1·90. Bill dusky greenish yellow; feet yellowish; posterior edge of tarsus and under surface of webs blackish. White under wings as in *amaurosoma*. Japan.

12. N. BREVICAUDUS Bp.

Puff. brevicaudus, Brandt. *Majaqueus brevicaudus*, Reich.

"Blackish fuliginous, lighter beneath; bill black, yellowish at base; feet cinereous, webs yellow." (Bp.) "Australian seas." Gould, [species mihi ignota.]

V. PUFFINUS Briss.

Moderate and small in size, bicolor, above brown or cinereus, below white. Wings very long and pointed; tail long, rounded. Feet very large; tarsus shorter than middle toe and claw; bill long, rather slender, compressed, hooked; nasal tubes short, flat, obliquely truncated; nasal septum broad, nostrils oval.

13. P. KUHLII Boie.

Proc. puffinus, Temm., Vieill. [1828]; et al, auct. Europ.; sed non Linn., quæ *P. anglorum*, Ray. *Proc.* sive *Puff. cinereus*, Cuv., Temm., Kuhl., Schleg., Degl. et al. auct. Europ. ferè omnium; sed non Gm., Lath., Vieill., Lawr. quæ *Adamastor cinereus*, Mihi; nec Aububon et auct. Amer. quæ *P. major*, Fab.

Bill yellow, its nasal tubes more elevated, compressed and vertically truncated than usual in this genus. Above light brownish ash or cinereous, each feather with a lighter margin, nebulated and undulated with pure white on sides of head and neck; posterior upper tail coverts and whole under parts, including under surfaces of wings and *all* the under tail coverts, pure white. Tail almost cuneiform; feet weak and slender, yellowish; outer toe and claw longer than middle do. North Atlantic Ocean only.

14. P. LEUCOMELAS Bp.

Proc. leucomelas, Temm.

Smaller than *P. Kuhlii*; weaker bill. Feathers of the upper parts and sides of head and neck grayish white, each with a longitudinal shaft line of brown.

15. P. CREATOPUS Cooper, n. sp. [in epistolis.]

With the general aspect of *P. major*. Bill short, usually swollen and stout at the base, nasal tubes elevated, turgid, short. Bill yellowish flesh color. Nasal tubes, culmen and tip blackish. Feet light flesh color! Upper parts generally as in *P. major*, but *no* white on upper tail coverts; no white at bases of primaries; the color of sides of head extending round on the throat, with no dividing line; and the under tail coverts entirely fuliginous black. Bill along culmen 1·60; height at base ·60.

16. P. MAJOR Fab.

Proc. puffinus, Kuhl, et auct. al. aliq. Europ. (sed non Linn., Gm., Lath. quæ *P. anglorum*, Ray; nec Temm. quæ *Kuhlii*, Boie.) *Puff.* sive *Proc. major*, Auct. *Ardenna major*, Reich. *Puff. cinereus*, Bp. [1828,] Audub., Nutt. non Gm.

Above smokey brown, the feathers with lighter edges. Posterior upper tail coverts mostly white. A definite line of demarcation between the brown and white on the sides of the head and neck. Length 18 to 20 inches; bill 2, wing 13, tarsus 2·40.

17. P. ANGLORUM Temm.

Proc. anglorum, Ray. *Puff. anglorum*, auct. *Proc. puffinus*, L., Gm. Lath., Brünn. sed non al. auct. quæ *P. major*. *Nectris puffinus*, Keys. et Blas. *P. arcticus*, Fab. *P. Baroli*, Bonelli.

Tarsus equal to middle toe without claw. Bill about two-thirds the tarsus, along culmen 1·40 inches; wing 9·25. Above very deep lustrous brownish black,—darker than in any other species.

18. P. YELCUANUS Bp.

Proc. yelkuan, Acerbi.

From the Mediterranean Sea. Like *P. anglorum*, but lighter colored above, the point of the wing more elongated, and lateral under tail coverts uniformly deep grey.

19. P. OBSCURUS Vieill.

Proc. obscurus, Gm. *Proc.* sive *Puff. obscurus*, auct. *Nectris obscurus*, Kuhl. *Cymostomus obscurus*, Macgill. *Puff. l'herminieri*, Less. *P. floridanus*, Mus. Berol.

Bill three-fourths as long as the tarsus. Tail very long, much graduated. Above grayish, or plumbeous black, not extending on the sides of the head below the eyes. Axillary feathers white. Longest posterior under tail coverts brownish black, rest white. Bill 1·25, wing 8, tail 4·25, exterior rectrices an inch shorter. Tarsus 1·60; middle toe and claw 1·80—inches and hundredths.

20. P. OPISTHOMELAS Coues, nov. sp.

From Cape St. Lucas. Generally like *P. obscurus*, but larger, with a longer bill and wings, a shorter, less graduated tail; almost all the under tail coverts and axillary feathers fuliginous black, and a different line of demarcation between the color of the upper and under parts on the sides of the head and neck. Bill 1·40, wing 9, tarsus 1·80, middle toe and claw 2·10, tail 3·75, outer rectrices only ·60 hundredths of an inch shorter.

21. P. NUGAX Bp.

Proc. nugax, Solander. *Puff. assimilis*, Gould. "*Proc. australis*, Eyton."

From the Australian seas. Smallest of all; wing only 6½ inches, tail 2¾, bill one inch, tarsus 1¼. The white of the under parts mounts high up on the sides of the head. Under tail coverts entirely white. Under surfaces of inner webs of primaries dull whitish.

May 3d.

Vice-President VAUX in the Chair.

Fourteen members present.

Mr. Cassin informed the Academy that our late fellow member, Mr. Samuel Ashmead, had bequeathed to the Academy his entire collection of Algae, together with the privilege of selecting from his mineralogical cabinet such specimens as may be desirable.

May 10th.

Vice-President VAUX in the Chair.

Thirteen members present.

May 17th.

MR. LEA in the Chair.

Twenty-two members present.

A paper was presented for publication entitled "New Unionidæ, Melanidæ, &c., chiefly of the United States." By Isaac Lea.

May 24th.

Vice-President BRIDGES in the Chair.

Eighteen members present.

A paper was presented for publication entitled "Descriptions of new marine Invertebrata from Puget's Sound, &c." By Dr. Wm. Stimpson.

May 31st.

Vice-President VAUX in the Chair.

Sixteen members present.

On Report of the respective Committees, the paper of Mr. Lea, read May 17th, was ordered to be published in the Journal, and the following papers in the Proceedings:

Critical Remarks on the Genera SEBASTES and SEBASTODES of Ayres.

BY THEODORE GILL.

In the Proceedings of the California Academy of Natural Sciences, "Remarks in relation to the Fishes of California, which are included in Cuvier's genus Sebastes," and subsequently, in the Proceedings of the Zoological Society of London, "Notes on the Sebastoid Fishes occurring on the coast of California, U. S. A.,"* have been published by Wm. O. Ayres, M. D., C. M. Z. S.

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* I have been favored by Prof. Baird with the advance sheets of these Proceedings.

The object of these memoirs is to show that there are eleven species of Sebastoid fishes in the Californian waters, distributable among two genera, distinguished *only* by the prominence or little development of spinous ridges on "the top of the head." For those with ridges he reserves the name *Sebastes;* for those with "little developed" ones, he accepts the name *Sebastodes*, proposed for a natural genus of which *S. paucispinis* is the only known species.

Rehearsing the history of *Sebastodes*, Dr. Ayres admits that the "*grouping of characters*" assigned to it "belongs only to the single species *S. paucispinis;*" and also in his final paper, that "the 'minute scales' belong only to *S. paucispinis*,"* and then proceeds to show that species of other genera have some of the characters attributed to it! He finally dismisses *Sebastodes* immediately after the remark that "the 'minute scales' belong only to *S. paucispinis*," with the conclusion that "it does not seem possible, therefore, (!!) that *Sebastodes* can be retained with such limits as were assigned to it by Mr. Gill"! The logical character of the inference is rather dubious, after the admission of the truth of a principal proposition. But for the benefit of Dr. Ayres, who may doubt the value of the character, the opinion of Dr. Günther, whose authority he will scarcely gainsay, is adduced. That gentleman attributes to *Sebastes* "scales of moderate or small size," and not minute ones like those of *S. paucispinis*, which, although admitted in the genus by him, he had never seen. Günther has, however, shown his appreciation of the value of the size of the scales in all his diagnoses of the Scorpænoidæ, and has separated the Triglæ of Europe into two genera solely on account of the size of the scales. Therefore the single character admitted by Ayres as peculiar to *Sebastodes paucispinis* would alone, in the opinion of some, entirely separate it from his other species, but when it is stated that it also differs remarkably in the form of the head, the skull, the preoperculum, the connection of the vomer and palatine bones, the direction of the anterior teeth of the jaws, the palatine rows, &c., the unnatural character of the association in one genus of it and species of the ordinary Sebastoid form will be obvious. *Sebastodes paucispinis* is decidedly the only known species of the genus.

Dr. Ayres "refers without hesitation to the genus of which the common species of Massachusetts Bay, *S. viviparus*,† is a member," the species of *Sebastoids* with the frontal and coronal spines moderately or extremely developed, stating that the difference in the number of dorsal spines, when "unsupported, does not appear sufficient." In this respect also he differs widely from Günther: that author distinguishes *Sebastes* by the number of spines,‡ assigning to it twelve or thirteen, and emphatically insists upon its value in his remarks on the *Centropogon australis*,—a species with fifteen spines,—remarking, that "this species approaches in general habit the genera *Sebastes* and *Scorpæna*, from which it must be separated on account of the number of the dorsal spines,—a much more certain generic character than the presence or absence of a preorbital spine, which is found in fishes that cannot be separated from *Sebastes* (*S. nematophthalmus*.)"§ Dr. Ayres will doubtless admit the justness of the denial of the pertinence of any Californian species to the same genus as *Sebastes* with fifteen dorsal spines, when acquainted with this emphatic endorsement of the value of the number of dorsal spines and the depreciation of the importance of the cephalic spines. It is true that Dr. Günther admits, as the first two species of *Sebastes*, *S. norvegicus* and *S. viviparus*, which have "fifteen" dorsal spines, and which are indeed the types of the genus, but that gentleman has shown his appreciation of the value of the character, and has only been unhappy in its application: he should have given a new name to the genus defined by him. Dr. Ayres has omitted to inform his readers that the difference in the number of dorsal spines is also supported by a corresponding difference in the number of vertebræ, the species of "*Sebastichthys* having, as far as known, only ten abdominal and fourteen caudal vertebræ,"[*] while *Sebastes* has about twelve abdominal and nineteen caudal vertebræ.[†]

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* Dr. Ayres has in his first article insisted that "the little 'accessory scales' mentioned by Girard are not confined to the three species stated by him, but are common to all;" but in his final paper, he has admitted the truth of Girard's and my own descriptions.

† Dr. Ayres has omitted to state that I was responalble for the identification of the Massachusetts *Sebastes* with *S. viviparus*, and that his knowledge of that identity was solely derived from me.

‡ "One dorsal, separated by a notch in a spinous and soft portion, with twelve or thirteen spines."—*Gthr.*, ii. 96.

§ Gunther, ii. 129.

The value of the characters used to distinguish the genera *Sebastes*, *Sebastichthys* and *Sebastodes* is now indeed so generally conceded by scientific men, that it is unnecessary to further argue in their favor. I shall only remark that the combinations and distinctions of forms by Dr. Ayres are alike unnatural and violate all natural affinities, and that the distinctions used by him to separate his genera *Sebastes* and *Sebastodes* are only of secondary value. More acquaintance with the species of the family would undoubtedly convince him of the justness of this assertion.

Dr. Ayres has been unfortunate in at least one of his identifications, connecting Girard's name *Sebastes rosaceus* with a species of "*Sebastodes*," with the remark that "this is the species originally described by Girard under the name *rosaceus*; and again, quite correctly, in the tenth volume of the 'Pacific Railroad Reports.'" Yet *S. rosaceus* is said to have "the upper surface of the head with horizontal and acute ridges," and is figured with such armature as well as with the second, instead of the third, anal spine longest, the pectoral and ventrals ceasing before the vent, &c.! Girard's *Sebastes rosaceus* is indeed a typical *Sebastes* of Ayres, and entirely identical with the *S. helvomaculatus* of the latter, as the examination of the two specimens known to Girard has convinced me. The specimens are in poor condition, but the spots are still visible. The *Sebastodes rosaceus* of Ayres is therefore deprived of a name, and may receive that of *Sebastosomus*[‡] *pinniger*.

It is also proper to here remark that two species are apparently confounded by Girard under the name *Sebastes melanops*, one with "a small spine upon the suprascapular bone, two others upon the edge of the opercle," and another from Cape Flattery with the lower opercular spine as well as the supraorbital ridges obsolete, and the forehead between the eyes perfectly arched. The latter may be named *Sebastosomus simulans*.

In conclusion, the genus *Sebastichthys* includes at least three genera. The *Sebastichthys nigrocinctus* is somewhat related to *Scorpæna*, and distinguished by elevated, serrated coronal crests. Other Californian species represented by the *Sebastes melanops*, seen by me, differ so much that they may be separated and combined for the present under a genus *Sebastosomus*, of which the *Sebastes melanops* of Girard may be taken as the type. Still others, distinguished by the texture of the bones of the skull, armed orbital ridges, prefrontals, &c., and represented by *Sebastes rosaceus*, Grd., may be named *Sebastomus*. In a contemplated Monograph of the Scorpænoids of California, the relations of the species will be more fully discussed.

Second Contribution to the SELACHOLOGY of California.

BY THEODORE GILL.

Since the publication of the article "On the Classification of the Families and Genera of the Squali of California,"[§] additional information has been given in the "Bulletin of the Museum of Comparative Zoology," by Mr. F. W. Putnam, in a "List of Specimens sent by the Museum to different Institutions," and in the Proceedings of the California Academy of Natural Sciences by Dr. W. O. Ayres.* The former enumerates the *Triacis semifasciata*, Girard, *Triacis Henlei*, Putnam (= *Rhinotriacis Henlei*, Gill) and *Acanthias Suckleyi*, Girard (= *Squalus Suckleyi*, Gill.) Dr. Ayres has in one article announced, very modestly and with scarcely a due appreciation of its bearings, a startling discovery regarding the range of variation of dentition in the Notidanoids, and in a subsequent communication, has informed us of the discovery of a representative of the genus *Alopias* in the Bay of San Francisco.

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[*] Gill, Proceed. Acad. Nat. Sci., Phila., 1862, p. 278.

[†] The increase in the number of vertebræ in the species of *Sebastes*, a genus peculiar to the Northern Seas, affords an excellent example of the truth of the generalization claiming an increased number of vertebræ for the cold-water representatives of the families of Acanthopterygians.

[‡] *Sebastosomus*, Gill. Type *Sebastes melanops*, Girard.

[§] Proc. Acad. Nat. Sciences, Phila., 1862, pp. 483—501.

Family *ALOPECOIDÆ.*

Genus ALOPIAS, Raf.

We are indebted to Dr. Ayres for the "Notice of the acquisition of a specimen of Thrasher," taken in the Bay of San Francisco. The species is a very close representative of the Atlantic form *Alopias vulpes*, differing, however, in the proportions of the dorsal and anal fins, and in the position of the branchial apertures; the tail constitutes decidedly more than half of the entire length. The specimen is about five feet in length."—(*Ayres*, op. cit., vol. iii. p. 66.)

Dr. Ayres has abstained from naming this species, and it may be hoped that the true differences between it and the Atlantic species will be exhibited by the future nomenclator. The announcement of any difference in the position of the branchial apertures from one not acquainted with the type, will be viewed with much skepticism by selachologists.

Family *GALEORHINOIDÆ*, Gill.

Subfamily MUSTELINÆ, Gill.

Genus MUSTELUS, Cuv.

This name may be reserved for the species distinguished by the anterior position of the first dorsal fin and the unicuspid teeth of the jaws. The *Mustelus lævis* of Müller and Henle is consequently excluded, the first dorsal fin being nearly midways between the pectoral and ventral fins, and the teeth provided with a lateral cusp in addition to the usual median one; the fœtus is also intimately connected with the uterus by means of a vitelline placenta, according to Müller and Henle, and is thus essentially distinguished from the typical *Musteli* which resemble the other *Galeorhinoids*. That species is therefore a peculiar generic type, and may hereafter be called *Pleuracromylon lævis*.

If the rule now adopted by many of invariably retaining a generic name for the first species mentioned is adopted, *Galeorhinus* will supplant *Mustelus*. I am not yet, however, prepared to adopt that rule, and shall for the present retain the name *Mustelus*. *Galeus* cannot be used for the genus typified by the *Squalus galeus* of Linnæus, and if *Galeorhinus*, which has been retained for it, should be shifted to *Mustelus*, a new name will be demanded for the former; as it is desirable that the change should be as slight as possible, that of *Eugaleus* may be accepted.

MUSTELUS CALIFORNICUS, Gill.

The first dorsal fin commences over the terminal third of the inner free margin of the pectoral fin, and its posterior point, though acutely prolonged, ceases considerably in advance of the ventral fins. The anterior angle is blunt, but not rounded. The second dorsal is similar in form to the first, but smaller, and its hinder half is over the anterior two-thirds of the anal, with the posterior angle of which its own is co-terminal. (The caudal fin, from the front of the lower lobe to its point, equals the distance between the snout and the interval between the third and fourth branchial apertures; its terminal lobe little exceeds a fourth of its length, and is squarely truncated behind?) The ventral fin has its outer margin, from the base to the angle, about as wide as the width from that angle to the posterior point. The length of the rostral plateau in front of the jaw equals the width between the outer margins of the nostrils and the interval between the corner folds of the upper jaw.

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* Proc. Cal. Acad. Nat. Sciences, vol. iii. pp. 15, 66.

D. 18 | 17. A. 18. P. 22.

This species is distinguished by the proportions of the snout, the more acutely prolonged posterior angles of the dorsal and anal fins, and perhaps the form of the terminal lobe of the caudal; but it is probable that the latter is worn, and consequently the statement of the length of the fin and the form of the posterior lobe must be accepted with reserve. The number of cartilaginous rays found after dissection of the skin is less than in the European species.

A single adult specimen was obtained by Dr. Stimpson at San Francisco, during his visit to that city as a member of the Scientific Corps of the North Pacific Exploring Expedition.

From Panama, the Institution has received several specimens of a closely-related species, distinguished by the projection of the posterior angle of the first dorsal fin to the vertical of the origin of the ventrals, although the anterior fourth of the base of the fin is above the pectoral. The caudal fin equals the distance between the snout and third branchial aperture, and its terminal lobe nearly equals a third of the length, and is obliquely truncated behind. The species may be named *Mustelus dorsalis*.

These species are interesting as being the first species of the genus found in the Pacific waters of America. The *Mustelus felis* of Ayres is a species of *Triacis!*

Family *NOTIDANOIDÆ*, Owen.

Genus NOTORHYNCHUS, Gill (ex Ayres).

In the year 1855, and in the first volume of the Proceedings of the "California Academy of Natural Sciences" (p. 73), "Dr. Wm. O. Ayres exhibited a specimen of a shark of a new generic type, with the following description" of the genus

"NOTORHYNCHUS, Ayres.

"Dorsal fin single. Branchial apertures seven on each side. Spiracles two. Nostrils double, subterminal. Snout broad, depressed. Tail much elongated, with the fin beneath. Teeth in several rows, those of the lower jaw flattened, arched, serrated; those of the upper jaw of diverse forms, the middle ones slender, the outer ones approximating those of the lower jaw in form."

He remarked, that "the shark here described presents, certainly, a very singular grouping of characters. The only genus with which it can be compared is Cuvier's *Notidanus*, previously separated by Rafinesque under the name of *Heptranchias*, both founded on Lacépède's *Squalus cinereus*. With this our type agrees in the remarkable feature of *a single dorsal fin* and *seven* branchial apertures. *But in* Notidanus *the teeth of both jaws are represented as similar in form, and the muzzle pointed*, the existence of spiracles being asserted by the one author and denied by the other. We have also in our fish the tail almost as much elongated as in *Alopias*."

The characters attributed to the genus *Notorhynchus* are *common to all the* *representatives of the family*, except the number of branchial apertures; in which respect the genus resembles *Notidanus* or *Heptranchias*. That genus has also the "teeth in several rows; those of the lower jaw flattened, arched, serrated; those of the upper jaw of diverse forms, the middle ones slender, the outer ones approximating those of the lower jaw in form;" the "snout broad, depressed;" "spiracles two,"—the invariable number when developed in all fishes!—and "the tail much elongated, with the fin beneath." *Notorhynchus* is therefore not distinguished by any character whatever from *Heptranchias*, either in the generic or specific descriptions of Ayres.

Such being the case, Girard and myself referred the species to the genus *Heptanchus* or *Heptranchius*, Raf., and the justness of that reference, under the circumstances, will be unhesitatingly admitted by every logical mind.

The causes of Dr. Ayres' manifold errors in the case are unknown; the peculiarity of the dentition of the Notidanoids is described in every text-book of ichthyology, and if Dr. Ayres had even consulted the Animal Kingdom, of Cuvier,—accessible to English students through a number of translations, his error would not have been committed.

Subsequently, I discovered the jaws of a Notidanoid taken at Nisqually, Oregon, by one of the gentlemen attached to Wilke's Exploring Expedition. Finding that the teeth were generically similar to those of *Heptanchus indicus* of Müller and Henle, and resembled them rather than those of the typical *Heptanchi* or *Hexanchi*, and, further, that the teeth of both more nearly resembled those of *Hexanchus* than *Heptanchus*, I felt compelled to combine the two species in a peculiar genus. I thus connected the views of Müller and Henle and others regarding the generic value of the number of branchial apertures with those of Bonaparte as to the generic value of the dentition. As the *Heptanchus indicus* was known to be "dark bluish grey above, with numerous small, irregular, black blotches, lighter beneath," the coloration attributed by Ayres to his *Notorhynchus maculatus*, I ventured to refer the jaws of the Nisqually shark to that species, since color is generally coincident with structure; the limited number of species of Notidanoids, the absence, so far as known, of two closely-related representatives in a single Fauna, and the occurrence of Ayres' species in the same faunal region as the Nisqually shark, appeared to warrant this identification, the necessity of confirmation of which, however, I did then, as I now do, emphatically insist upon. I therefore perfectly agree with Dr. Ayres as to the impossibility of certainty "when [his] description is so extremely indefinite," and, in order that further cavil at the identification of the Nisqually shark with *Notorhynchus maculatus* may be avoided, suggest that the former may be named *Notorhynchus borealis*.

Having previously identified the Nisqually shark with the Californian Notidanoid—erroneously it may be—I felt compelled to retain Ayres' name, and did not detail the history of the genus, as such would have involved the necessity of criticism, but simply remarked that the name "was proposed by Dr. Ayres under a misapprehension."

Immediately after the publication of my article, Dr. Ayres* insinuated that his name was not given under a misapprehension, and asserted that his "'misapprehension' was, that (he) regarded the species as the type of a new genus." Such misapprehension is of course evident, but I cannot perceive why the name should be considered apart from the idea of the genus. I indeed think that the name itself, considered in the abstract, is objectionable and rather unmeaning if not, indeed, more censurable. The etymology of the name is not obvious; its formation would indicate that it meant "back snout, or beak," but it is possible that it is composed of νοθος and ρυγχος, in allusion to the protuberant snout.

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* Proc. California Acad. Nat. Sciences, iii. p. 15.

Dr. Ayres then implies that it is only after several changes that I have arrived at the conclusion regarding the generic distinction of *Notorhynchus*. I have had two opinions, one, before seeing the species, that it was a *Heptranchias* of Rafinesque or *Heptanchus* of Müller,—accepting the views of Müller and Henle, Gray, Girard, &c.,—and the final one, after study of the Nisqually jaw, that it was the representative of a distinct genus. For that genus I have adopted Ayres' name, but by no means the ideas connected with it by him.

One statement of Dr. Ayres is especially entitled to attention, as, if corroborated, it must effect an entire revolution in our views respecting the value of dentition, and is entirely opposed to the experience of Müller and Henle, Bonaparte, Agassiz, and all others. He remarks that my description of the dentition "represents the individual specimen on which it was founded; but the species is quite common here, and I find that the number and the forms of the teeth vary so much that my original description, which Mr. Gill says is 'equally applicable to any species of the family,' is fully as close as nature will allow us to draw." It is certainly rather unfortunate for science, as well as himself, that Dr. Ayres has omitted to produce proof of so remarkable a discovery, as, on account of the respectability and number of the gentlemen alluded to who have adopted other views, and in deference to whom reasons might be assigned, it will be regarded with at least some doubt and skepticism, notwithstanding even Dr. Ayres' assertion. It is scarcely necessary to remark, that if this discovery is confirmed, *Notorhynchus* must be suppressed and its species referred to *Heptranchias*; but until such is done, it may, without any imputation on the perfect reliability of Dr. Ayres, be retained, since that learned gentleman has himself done so, notwithstanding his discovery and the admission of a misapprehension in regarding its representative as the type of a new genus.

June 7th.

MR. JEANES in the Chair.

Seven members present.

Mr. Gill called the attention of the members to several points in Ichthyology and Conchology. He exhibited from the collection of the Academy a specimen of a species of *Percopsis* obtained by Surgeon General Hammond in Kansas. The differences between it and the *Percopsis guttatus*, Ag., of Lake Superior, also exhibited, were strong; the head is larger, (contained 3½ times in the length, *exclusive of caudal*;) the dorsal is higher, (the longest ray equal to 4⅔ of length;) the anal is also higher, (the longest ray contained six times in length;) the pectoral equals the height of the dorsal (=4⅔;) the ventral especially is longest, contained 5¾ times in the length, and its extremity covers the anus, which is nearer the snout than the margin of the caudal fin. The species may be named, in honor of its distinguished discoverer, *Percopsis Hammondii*.

Mr. Gill remarked that, after an examination of the species of *Sodis*, Raf., and *Paralepis*, Cuv., in the collection of the Academy, he was convinced that the families of Paralepidoids and Alepidosauroids were most closely allied.

Mr. Gill next referred to the history of the name *Gymnotus*, showing that it had been originally founded solely on the *Gymnotus carapus*, and that even after the introduction of the *Gymnotus electricus* into the system, the *G. carapus* was retained as the first of the genus. The retention of the name *Gymnotus* for the *G. electricus* and the bestowal of a new one on *G. carapus* are therefore obvious infractions of the laws of nomenclature. The name *Gymnotus* must be retained for *G. carapus*, and a new one given to the *Gymnotus electricus*, Linn.

That of *Electrophorus* will be appropriate. This change is the less to be regretted, as the nomenclature of *carapus* is in a confused state, that name having been previously applied by Rafinesque to a species of the genus *Fierasfer*. Mr. Gill gave an enumeration of the genera of Gymnotoids, admitting the genera *Electrophorus*, *Gymnotes*, Gill, (Gymnotus æquilabiatus, Humb.,) *Gymnotus*, Art., (=Carapus,) *Sternopygus*, M.T., *Hypopomus*, Gill, (*Rhamphichthys Mulleri*, Kaup,) *Rhamphichthys*, M. T., *Sternarchus*, Schneid., and *Sternarchorhynchus*, Cast. Mr. Gill concluded by suggesting that the Gymnotoids were perhaps related to the Nematognathi, and remarked that he knew several undescribed species.

Mr. Gill next called attention to the fact that the genus for which the name *Melantho* had been recently accepted from Bowdich, had long before been characterized under the name *Campeloma* by Rafinesque. In June, 1819, in the 88th volume of the Journal de Physique, (p. 423,) that type is introduced in the following terms:

(26) Campeloma. Test ovale. Ouverture ovale, base tronquée, lievres réfléchies, flexeuses, unies en pointe postérieurement. Point d'ombilic. Animal inconnu. J'en ai une seule espèce trouvée dans l'Ohio. *C. crassula.* 4 tours de spires contraires, sommet aigu, test épais, ouverture plus de la moitié de la longueur totale.

This diagnosis is evidently only applicable to a Viviparoid, and was doubtless founded on a reversed specimen of the *Paludina ponderosa* of Say, or a closely related species. The name has indeed been referred, by the erudite Hermannsen, to the synonymy of *Melanopsis*, and in this he has been followed by the brothers Adams, but the diagnosis, as well as the habitat, cannot support such a reference.

In advance of the publication of the generic name *Campeloma*, Rafinesque had proposed a new genus—*Ambloxis*—in the third volume of the "American Monthly Magazine and Critical Review," (p. 355, Sept., 1818,) which was also doubtless intended for the *Paludina ponderosa* and its congeners,* but the insufficiency of his generic diagnosis, as well as the want of connection with any *described* species, will prevent its adoption.

The speaker remarked that he would not attempt to enumerate the species of *Campeloma*, as he could not agree with previous authors regarding their limits, and had not the material to arrive at a satisfactory opinion himself; he could therefore only refer to the genus an assemblage of forms represented by the same specific names as were formerly placed under *Melantho*, after the exclusion of *Paludina Elliottii* of Lea, which probably belongs to the genus *Lioplax*. The names referred to the synonymy of the other species mentioned under that genus appear to represent forms of the genus, with the exceptions of *Paludina cornea*, Val., and *Lymnula ventricosa*, Raf. The former name was doubtless proposed for the *Lioplax subcarinata*, having the "sutures deeply impressed," and the "*rampe*" around the spire being especially characteristic of that shell. The *Lymnula ventricosa* was probably founded on *Anculosa praerosa*, or an allied species.

June 14th.

Vice-President Bridges in the Chair.

Twelve members present.

A paper was presented for publication entitled "On the Influence of the Earth's Atmosphere on the Color of the Stars." By Jacob Ennis.

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* III. G. Ambloxis. Univalve. Shell thick oboval; mouth oval. rounded at the base, obtuse above, with a thick appendage of the lip; columella flexuous; a small rugose umbilicus. 2 species.—1. *A. eburnea*; 2. *A. ventricosa*, Raf.

June 21st.

Vice-President **Bridges** in the Chair.

Fourteen members present.

June 28th.

Dr. Carson in the Chair.

Eleven members present.

A letter was read from Thos. B. Wilson, M. D., of date June 28th, 1864, tendering his resignation as President of the Academy.

On report of the respective committees, the following papers were ordered to be published in the Proceedings:

Descriptions of new species of Marine INVERTEBRATA from Puget Sound, collected by the Naturalists of the North-west Boundary Commission, A. H. Campbell, Esq., Commissioner.

BY DR. WM. STIMPSON.

The following descriptions are extracted, by permission, from the Zoological Report of the Boundary Commission. They were written in the year 1860, and accompanied by illustrative drawings of all the species, which, it may be hoped, will soon be published.

CRUSTACEA.

Eupagurus Kennerlyi.

Carapax smooth, except where the setæ are attached. Median tooth of the front nearly obsolete; lateral teeth small but sharp and well-marked. Eyes moderately long and slender, but not longer than the peduncle of the outer antennæ; cornea little dilated, with a tuft of hair at the apex. Acicles small, pilose, not reaching the tips of the eyes. Feet all very hairy. Chelipeds short and stout, both falling considerably short of the extremities of the ambulatory feet, and strongly but not very thickly armed with short spines. In the greater cheliped the carpus is about as long as the palm of the hand; fingers shorter than the palm; two distinct rows of sharp tubercles on the dactylus. Smaller cheliped hardly reaching to the middle of the dactylus of the greater one, convex, or with an obtuse median carina armed with strong spines. There are no prominent spines or tubercles on the inferior surface of the merus and carpus in either cheliped. Color of hands in alcoholic specimens light red.

Length 2 inches; length of carapax, 0·4; of right carpus and hand together 0·51 inch.

An orthodactyle species, near *E. pubescentulus*, but with shorter and strongly spinous chelipeds. We have named it after the late lamented naturalist who discovered it.

Hippolyte prionota.

A short, plump species. Carapax with a high, compressed back, crested nearly the whole length, somewhat channelled longitudinally on each side near the crest, and armed with three spines in a longitudinal row above and behind the eyes; also with a strong antennal and a pterygostomian spine. Dorsal crest not sharp and lamelliform, but armed with four strong teeth, the front edges of which are beset with aculei, which, especially in the posterior teeth, form a transverse row when viewed from above. Rostrum more than half as long as the carapax, lamelliform, very broad, though not as broad as long; its front outline blunt, triangular or rounded; whole upper front and end margin minutely serrated with hispidiform teeth; lower margin with four small simple ones near the end. Eye with a spine at the inner apex; squamiform appendix to the antennæ elongate-triangular in shape, with pointed end, not reaching beyond the rostrum. External maxillipeds reaching nearly to extremity of rostrum, and provided with both exognath and epignath; antepenult joint broad, with a strong spine at the external apex. Feet of the first, second and third pairs provided with an epipod. Abdomen with the dorsum rounded; third joint a little prominent, with an obtusely triangular, not conspicuous tooth at the posterior margin; lower margins of the segments smooth and obtuse, except the fourth and fifth, which form teeth. Four pairs of dorsal aculei on the terminal joint. Length about one inch.

Easily distinguished from the other North Pacific lamelli-rostral species by the serrated margins of the dorsal teeth and rostrum. It approaches nearest to *H. spina* (*Sowerbei*), but has three supra-orbital spines instead of two. From *H. pectenifera* it differs in the non-pectinated margins of the abdomen.

Seven specimens of this fine species were dredged in February and March, by Lieut. White, in different parts of the Sound, viz., in Hale's Passage, 10 fathoms, soft bottom; off Lummi I., in 8—12 fathoms, shelly; near San Juan I., in 2—4 fathoms, mud.

HIPPOLYTE SUCKLEYI.

Carapax with the anterior half of the dorsum crested and sloping forward; no supra-orbital spines; a strong antennal and pterygostomian spine present. Fourth joint of abdomen acute below. Rostrum large, but scarcely as long as the carapax, curved, rather broad and lamelliform, with a slender acute tip; lower margin four-toothed; upper margin including crest of carapax six-toothed, beginning at the anterior third of the length of the rostrum. External maxillipeds of moderate size, reaching nearly to extremity of antennary appendix, and provided with both exognath and epignath. Feet long, the last pair reaching nearly to the tip of the rostrum; first pair only provided with an epipod; dactyli of the last three pairs elongated, with only one terminal unguiculus. Abdominal segments with smooth edges; superior margin of third segment obtuse. Length 1½ inches.

In the characters of the dorsal crest and rostrum it is much like *H. Gaimardi*, but it has no spine over the eye. From *H. Fabricii* it differs in having more numerous teeth on the superior margin of the rostrum, some of which are placed nearer to its extremity. It has less numerous superior teeth than occur in *H. Layi*.

Dredged in the circumlittoral zone. We have conferred upon this species the name of our friend Dr. Suckley, one of the earliest and most successful investigators of Pugettian Zoology.

HIPPOLYTE STYLUS.

Body slender; abdomen strongly geniculated. Carapax smooth; back not crested except for a short distance anteriorly. There is an antennal spine, but neither supra-orbital nor pterygostomian. Rostrum slender, somewhat styliform, perfectly straight, and equal to the carapax in length; it is armed above with four or five teeth near the base, while the anterior two-thirds is edentulous; below there are five or six teeth. Antennary appendix oblong, scarcely shorter than the rostrum, and obliquely truncate at the end. External maxillipeds very small, reaching only to the extremity of the peduncle of the antennæ, or to the basal third of the rostrum; they are provided with an epignath, but no exognath. None of the feet have an epipod. Terminal joint of the abdomen with four pairs of dorsal aculei. Length 1½ inches.

Taken in the Straits of De Fuca by the U. S. Exploring Expedition.

HIPPOLYTE GRACILIS.

This is the most slender species which has come under our notice. The carapax is crested at the anterior third; there are no supra-orbital spines, but the antennal and pterygostomian spines are present, the latter spine being high in position from the narrowness or little height of the carapax. Rostrum exceedingly slender, scarce higher than wide, curved. a little longer than the carapax, and armed with four teeth over the eye; elsewhere smooth to the tip; below there are four minute distant teeth. The antennulæ are rather long, the thick flagellum reaching to the extremity of the rostrum. Antennary appendage a little longer than the rostrum. The external maxillipeds reach to the middle of the rostrum and have no exognath; the epignath perhaps exists, but we have been unable to discover it in our specimens. The feet are very slender, and none of them have an epipod. The abdomen is very long and strongly geniculated. Third segment compressed and prominent, as in *Pandalus*; penult joint much elongated. Length 1¼ inches.

Found in deep water.

IDOTHEA WHITEI.

Body slender; sides slightly convex; head large. Outer antennæ nearly two-thirds as long as the body; the flagellum equalling the peduncle in length and composed of from sixteen to eighteen joints. First thoracic segment short, less than two-thirds as long as the second. Abdomen segmented as in *I. Wosnessenskii* and the others of this group; it is one-half longer than broad, slightly narrowing posteriorly, with the extremity rounded, truncate, and bluntly acuminated at the middle. Feet moderately stout. Color yellowish, minutely punctate with dark gray. Length of body 0·81; length of abdomen 0·27 inches.

It is allied to *I. Wosnessenskii*, but is very much more elongated. It differs from *I. media*, following Dana's description, in its much longer antennæ.

We have dedicated this species to Lieut. J. W. White, who commanded the Revenue Cutter in the Sound while the Boundary Survey was in progress, and who rendered essential aid to the Naturalists of the Survey, by dredging many of the most interesting novelties which were obtained.

IDOTHEA UROTOMA.

Body nearly linear, nearly five times as long as broad, broadest at the sixth thoracic segment. External antennæ a little more than one-half as long as the body; last two joints of the peduncle subequal; flagellum a little shorter than the peduncle and ten-jointed. Abdomen consisting, as in the others of the group, of three joints, with the partial separation of a fourth; subrectangular with convex extremities, and scarcely less broad at its truncate posterior extremity than at the anterior. The posterior extremity is peculiar in shape, the angle on either side projecting strongly, and separated by a notch from the convex or subtriangular middle portion, which bears a small tooth at the middle. The opercular abdominal feet which cover the branchial or swimming feet are large, nearly covering the entire under side of the abdomen. Thoracic feet slender. Length of the body 0·75; greatest breadth 0·17; length of the abdomen 0·20 inch.

We find no note of the depth of water in which this species was dredged.

AEGA BELLICEPS.

Smooth, subelliptical, and pointed anteriorly. Head with a small, short, blunt, rostriform process over the base of the superior antennæ. Eyes ovate, very large, but distant, and beautifully granulated (facetted). Thorax rather broad; segments each marked with scattered impressed punctæ, mostly in a transverse row. Abdominal segments five in number, the terminal one scutiform, with its margin entire; apex obtuse. In the alcoholic specimens the color of the body is yellowish-gray, clouded; lateral margins with a series of black spots or blotches; base of abdomen black; caudal segments edged with blackish; eyes blue. Length of the body 0·76; greatest breadth 0·37; length of caudal segments 0·20 inch.

Two specimens are in the collection. It is perhaps an *Acherusia*, but we have access to no figure or description of that genus of Lucas.

BOPYROIDES ACUTIMARGINATUS, nov. gen. et sp.

We propose this name for a new parasitic anisopod which we are unable to refer to any genus hitherto established, though it approaches very closely to *Bopyrus* in form, and indeed in all its characters, except that the abdominal branchiæ of the female are rudimentary, being merely transverse fleshy ridges, instead of laminæ. The upper surface, except the somewhat convex head, is flat and smooth, with the segments sharply defined. The margins of the body are very acute and somewhat recurved, especially at the head. The abdomen is distinctly six-articulated, the joints being indicated by deep incisions around the entire margin, dividing it into eleven subequal parts, so that the terminal joint is very small, no larger than a lateral extremity of one of the preceding ones. It is 0·29 inch in length, and 0·21 in greatest breadth.

It is found in the branchial cavity of *Hippolyte brevirostris*.

Bopyrus hippolytes Kroyer, belongs properly to the same genus. From this species ours differs in the acuteness of the margins and in the sharply square-cut lateral extremities of the abdominal segments.

CAPRELLA KENNERLYI.

A large, pellucid species. Head armed with two small slender spines above, in a transverse line over the eyes. No spines on the first thoracic segment, and scarcely any on the second. The remaining segments, however, are armed with strong sharp tubercles on the sides, and a few smaller ones above. These tubercles become progressively sharper posteriorly. Superior antennæ about one-half as long as the body; peduncle very thick and strong, with the first joint shorter than the second, and the last joint two-thirds as long as the second; flagellum very thin, filiform, equalling in length the last joint of the peduncle, and consisting of twenty joints. Inferior antennæ small, reaching the middle of the second joint of the superior antennæ, subpediform, and setose below. Branchial vesicles subovate, one-half longer than broad. Hand of the second pair of feet elongated, nearly three times as long as broad, thick and armed with two or three small slender teeth on the concave palm. Feet of the three posterior pairs short.

Length of the body 1·1; of the superior antennæ 0·52; of the first and second thoracic segments taken together 0·44 inch. The description is that of a male.

Found on the bottom of the Revenue Cutter at Port Townsend.

AMPHITHOE HUMERALIS.

Body robust, entire; dorsum rounded, smooth and unarmed. Eye of moderate size, rounded, situated on a short projection of the head between the bases of the superior and inferior antennæ. Superior antenna nearly as long as the body, the peduncle constituting less than one-third of its length; flagellum tapering to an exceedingly fine extremity. Inferior antenna half as long as the body, with its flagellum no longer than the antepenult joint of the peduncle. Epimera of the fifth pair large. Gnathopoda, or feet of the first two pair, with rather small, weak, subpediform hands in both sexes; those of the third and fourth pairs with the basal joint very large and much expanded, nearly as broad as their epimera; meros-joint in the same pairs small, compressed, with a sharp arcuated anterior margin. Caudal stylets all with equal rami; last pair with the rami very short and flattened, the outer one armed with small hooks at its extremity. Telson small, obtuse-triangular.

Length of the body in a female, 1·2; height at the fifth thoracic segment, epimera included, 0·25 inch.

Found about low-water mark.

ANONYX FILIGER.

Head with a strong triangular process on each side beneath the base of the superior antennae; extremity of this process not acute. Superior antennæ very short, about as long as the head, with a long, thick pencil of hair on the inner side of each; basal joint large, with a strong protuberance above, forming a prominent angle at its anterior extremity; flagellum seven-jointed, the first joint constituting one-third of its length; accessary flagellum tri-articulate. Inferior antennæ longer than the body; the peduncle, however, constitutes but a small part of their length, being but little larger than the superior antennæ; the very slender filiform flagellum appears as if serrated above, but is not provided with calceolæ. The first pair of feet in our single specimen appear to be pointed and simple, the dactylus not being retracted against the manus, which has no palm; second pair with a minute truncate hand, supporting a small tuft of hair at the base of the dactylus.

The dorsum in this species is sharp, or carinated, but not dentated, being entire and smooth in outline for the greater part of its length, and similar in the thoracic and first three abdominal segments. There is, however, a deep, triangular sinus between the third and fourth abdominal segments, the latter being strongly protuberant, projecting over the very small fifth segment. The second abdominal segment is subtruncate below, and has a deep semicircular sinus on the anterior lateral margin, near its lower extremity. Rami of the last pair of caudal stylets shorter than those of the second pair, and telson rather elongated and slit in two down the middle.

Length about one-third of an inch.

It resembles an English species of which a figure has been privately circulated by C. Spence Bate, Esq., under the name of "*Lysianassa chausica* M. Edw."

Dredged in deep water, by Lieut. White.

GAMMARUS SUBTENER.

A small, compressed species of rather soft and delicate structure. Dorsum rounded. Epimera moderately large. Eye broad-oval, nearly round. Antennae of both pairs very slender; superior ones as long as the body. Basal joint more than twice as thick as the next, but shorter; third joint less than half as long as the second; flagellum with about thirty articulations; accessory flagellum nearly twice as long as the last joint of the peduncle.

Inferior antennæ nearly three-fourths as long as the superior ones; first joint of the peduncle armed beneath with a sharp process, which nearly reaches the end of the second; third joint more than twice as long as the first; fourth shorter than third; flagellum two-thirds as long as the peduncle.

Second gnathopod with merus and carpus acute below; hand subovate, twice as long as broad; palm oblique, with a small, sharp tooth at its posterior extremity, reached by the tip of the finger when closed. First, second and third joints of the abdomen armed above with a sharp central spine on the posterior margin, and with four or five minute spines, or sharp comb-like teeth on each side of the middle spine, the margin bearing these latter spines being a little concave. At the corresponding part of the fourth and fifth abdominal segments, there are also two or three spines similar to the central spine of the other segments, though not quite so large. Telson bifid, the forks rather elongated. Color of the alcoholic specimens greenish-grey, mottled with paler and darker patches. Length about two-fifths of an inch.

Although we have not seen the posterior pair of caudal stylets in this species, which are lost in both our specimens, we have little doubt that it is closely allied to *G. longicauda* Brandt, which inhabits the Asiatic coast of the North Pacific, in which these stylets are very long. It differs from the Asiatic species in having a spine at the extremity of the palm in the greater gnathopod, in the shorter terminal joint of the peduncle of the superior antennæ, in the basal spine of the inferior antennæ, and in the arrangement of the dorsal spines of the abdomen.

This species inhabits the circumlittoral zone.

AMPHITHONOTUS SEPTEMDENTATUS.

Strongly compressed and carinated, like *A. carinata;* carina dentated posteriorly, the last two thoracic, and first five abdominal segments terminating posteriorly in teeth; last two teeth very much projecting and sharp. Head with a deep notch or sinus on the front margin, near the inferior angle, at the insertion of the inferior antennæ. Rostrum rather slender, sharp, a little curving downward, and reaching to a little beyond the middle of the first joint of the superior antennæ. Eye moderately large, oval, and oblique in position. Antennæ about one-third as long as the body; the superior ones with flagellum of eleven joints; inferior ones about as long as the superior, with a forward-pointing spine at the base below, and a seven-jointed flagellum.

Gnathopoda with small but well-formed subcheliform hands; remaining feet as usual in *A. carinatus* and the other species of the group. Length half an inch.

Found at and below low-water mark.

AMPHITHONOTUS OCCIDENTALIS.

Closely allied to the arctic *A. panopla* Kr., and the east-coast species, *A. cataphractus* Stm., but differing from both in being more elongated, having less height and breadth. It also differs from the latter species in being less strongly carinated and dentated; but the carinæ are sharper than in *A. panopla*, and the two teeth on the second abdominal segment are especially prominent. The integuments are rather less indurated than in the allied species. The superior antennæ are a little longer than the inferior, but scarcely more than one-fourth as long as the body.

Length from tip of rostrum to tip of telson, 0·76; greatest breadth, 0·21; height, 0·24 inch.

Two specimens were brought home by the Boundary Commission.

AMPELISCA PUGETICA.

Head not much produced. Antennæ of both pairs very slender; superior ones less than half as long as the inferior ones, with the basal joint very thick, twice as thick, though only half as long, as the next joint. Superior antennæ four-fifths as long as the body; peduncle long, smooth above. Dorsum of the thorax and abdomen for the most part smooth and rounded, but the last three joints of the abdomen are separated from the preceding ones by a deep notch, and project into two sharp teeth. Terminal joint in the third and fourth pairs of feet, one-half longer than the two preceding joints together. In the seventh pair of feet the meros-joint is expanded posteriorly into an ovate lamina, fringed with plumose setæ, as in *A. laevigata*. Posterior margin of the third abdominal segment with a small notch just above the inferior angle. Last pair of caudal stylets large, with rami much longer than those of the two preceding pairs. Telson oblong, narrower and less tapering than in most species of the genus.

Length 0·45 inch.

Dredged in ten fathoms, on a muddy bottom, in Hale's Passage, by Lieut. White.

AMMOTHEA LONGICAUDATA.

Body broad, robust, hispid above. Eye placed on a high papilla, and double, or divided in two longitudinally. Chelate "antennæ" much shorter than the proboscis; their slender lower branch, however, is much longer, nine jointed, not tapering, and with blunt extremity. Proboscis large, very stout, elliptical in outline. Feet rather thick, fourth joint stoutest; upper surfaces sparsely hispid; basal joints armed with slight dentiform protuberances, ovigerous feet of moderate length. Abdomen large, half as long as the body. Diameter nearly three-fourths of an inch.

We know the genus *Ammothea* of Leach only by the short diagnosis of Dana, in the U. S. Exploring Expedition, Crust, ii., p. 1390 ("Nympho affinis. Ramus antennæ longior, 9-articulatus,") and may be wrong in referring this species to it. One specimen occurs in the collection.

GEPHYREA.

PHASCOLOSOMUM EXASPERATUM.

Body brownish, curved in the form of an arc, and thickest near the posterior extremity. Surface wrinkled transversely and covered with small blackish grains, about one-sixtieth of an inch in diameter, rather larger and less crowded posteriorly, and smaller and less numerous on the concave than on the convex side. Proboscis bluish-white, with numerous irregular transverse blackish bands, interrupted on the concave side. The proboscis being partially retracted in our single specimen, we are unable to see its extremity distinctly, but it seems to have a series of six or eight crowded rings of minute blackish echinulations next the mouth, as in the allied forms.

Length 2 inches; thickness of the body, 0·46; thickness of proboscis, 0·2 inch.

STERNASPIS AFFINIS.

Almost identical with *S. fossor* Stm., from Massachusetts Bay, but with the body smoother about the middle, where there is no trace of the echinated annuli, which may be discerned even on the middle segments in *S. fossor*.

Found in muddy bottoms in from ten to twenty fathoms.

Dredged by Lieut. J. W. White.

TUNICATA.

CYNTHIA HAUSTOR.

Body globular, strongly and coarsely corrugated in an irregularly reticulating manner, with the interstices deep and the prominent parts covered with coarse sand, strongly agglutinated. Apertures at the extremities of long cylindrical tubes, nearly equalling in length the diameter of the body. These tubes are wrinkled transversely, and are from one-third to one-half as thick as they are long. The branchial tube is considerably longer than the anal.

Diameter about two inches.

With the next species, this forms masses which are found somewhat abundantly on shelly bottoms in the circumlittoral zone in Puget Sound.

CYNTHIA GIBBSII.

Body elongated, attached at one end, more or less cylindrical, or somewhat appressed and, when contracted, half as thick as long. Surface free from encrusting matters, corrugated both longitudinally and transversely; the longitudinal plications are frequently strongest and most regular, but often they are rendered irregular or nearly obliterated by the transverse ones. The apertures are placed near together at the extremity of the body on slight protuberances, which are probably produced in life into short tubes. Branchial sac with ten slight longitudinal folds, not lamelliform; filaments at its summit numerous, small, slender and simple.

The largest specimen is 1·4 inch in length, and 0·6 in breadth.

According to Dr. Kennerly's notes, this species was dredged by Lieut. White at the following places: Port Townsend, in 4 fathoms, shelly bottom, and also on a muddy bottom in 10 fathoms. Off the N. W. end of Lummi Island, in 15 fathoms, shelly bottom.

The dedication of this fine species to one so well known upon the survey as Mr. George Gibbs, is scarcely necessary to indicate the great interest he has taken in its scientific results.

CYNTHIA CORIACEA.

A tough, unornamental species, with no very strongly marked characters. It is irregularly egg-shaped, and attached by a broad surface on the right side of the body. The test is free from agglutinated matters, smooth, and scarcely at all wrinkled, except about the apertures, which are on rather large protuberances, probably extensible in life into short tubes. The branchial aperture is largest, and situated at the extremity of the body; the anal a little behind the middle of the upper side. Branchial sac with about the same number of folds as in the preceding species, which are, however, very prominent and lamelliform, being broader than half the width of the interspaces. The filaments at the summit of the branchial sac appear to be few, and shaped like the palpi of the bivalve acephala.

From the slight indications yet observable in the specimen, it would seem to have been of a reddish color when alive.

It was found upon the "shore of Island No. 2, off Salt Spring Island, March 9, 1859," by Lieut. White, of the Revenue Cutter.

CYNTHIA VILLOSA.

Of similar size, and allied to the *C. echinata* of the North Atlantic, of which this is the analogue or representative species on the west coast. It is, however, easily to be distinguished from that species by the character of the villosity or short, hair-like processes with which the test is covered. These are shorter, more numerous than in *C. echinata*, and not provided with radiating hairs at the summit, being simply tapering to a fine extremity, and sparsely pubescent on their sides.

The base of attachment in this species is very small, and the test at that point is produced into a peduncle, which is sometimes as long as the body is thick. This peduncle is, however, entirely similar to the test in character, and not at all like that of *Boltenia.* Our largest specimen is about 0·6 inch in diameter.

Dredged by Lieut. White in "Port Townsend, 10 fathoms, muddy bottom," and "off the N. W. end of Lummi Island, in from 8 to 15 fathoms, on shelly bottoms, March 2d and Feb. 22d, 1859."

Genus CHELYSOMA, Brod. and Sow.

The "tortoise-shell" Ascidians, which form the curious arctic genus *Chelysoma,* have the posterior extremity of the body flattened, forming an oval disk with a raised margin, and the surface divided into polygonal plates. But two species have been hitherto known, the *C. Macleayana,* from Greenland, and *C. geometrica* (*Ascidia geometrica* Stm., Mar. Invert. of Gr. Manan.)

from the Bay of Fundy. We have a third species from Behring's Straits, and that described below makes a fourth.

CHELYSOMA PRODUCTA.

All other known species of this genus are remarkable among Ascidians for their depressed form, the body being very short, sessile, attached by their flattened anterior extremity, to which the broad disk is parallel, and forms nearly the whole of the part of the body which is exposed to view. In *C. producta*, on the contrary, the anterior part of the body is much produced, laterally compressed, and longer than the disk is broad, while its attachment is inferior and usually very narrow. In well-formed specimens the dorsum is compressed and arched with a well-marked carina, beneath and parallel with which the rectum may be seen through the translucent test. The disk is obliquely placed, and its margin projects strongly beyond the sides of the body. Its surface is divided into 14 polygons, 4—5 sided, beside the two which contain the apertures, each of which latter is again subdivided into six triangular valves.

In our largest specimens the body is 1·5 inch in length, and 0·5 broad at the middle; the disk is 1·08 high and 0·81 broad.

It is usually attached to Sertularians.

Dredged by Lieut. White in "8 to 12 fathoms, shelly, off the N. W. point of Lummi Island."

HOLOTHURIADAE.

PENTACTA PIPERATA.

Allied to *P. frondosa.* Body ovate, smooth and glabrous, of a yellowish color, speckled and spotted with black. Sucking feet retracted in our specimens, not numerous, and arranged in five irregular rows. Tentacula short and broad, ramose. Length (contracted) 1½ inches: breadth, 0·8 inch.

We find three or four specimens in the collection, none of them with protruded tentacles.

PENTACTA POPULIFER.

Body thick-fusiform in shape. Surface entirely covered with minute, perforated, polygonal, calcareous plates, each plate having from twenty-five to forty holes, and being armed with a sharp umbo or spine at the centre of its outer surface. Sucking-feet small, of moderate length, very numerous, and arranged in five regular double rows, extending from one extremity of the body to the other. Tentacula ten, eight large and two small; the large ones of elongated form, and shaped like Lombardy poplar trees, (*Populus dilatata*), branching nearly from the base; branches short. The small tentacles are placed together, and are minute, not a tenth part as long as the others. Length of the largest specimen 2 inches; usual length from 1 to 1½ inches.

From the number of specimens collected we judge this species to be common in the Sound. It is found in the circumlittoral zone.

The Influence of the Earth's Atmosphere on the Color of the STARS.

BY JACOB ENNIS.

From the small amount of attention paid to the colors of the stars as a distinct branch of physical research, a vague and indefinite impression has been somewhat prevalent that the atmosphere of our earth has great power in producing the apparent colors and the changes of colors of the fixed stars. The subject is highly important. During the last two or three years it has occupied much of my attention, and I propose in this paper to present my method of investigation and the results to which I have been led. To ascertain what the influence of the atmosphere might be, I selected for special observation a few of the larger stars, taking some of the red, some of the blue, some of the green, some of the yellow, and some of the white. So many different classes of stars watched carefully during the various changing conditions of the atmosphere, seemed most likely to yield valuable conclusions.

1. The red stars were Aldebaran, Antares, and Betelgeuse. These are all of different shades and intensities of red. In proportion as the atmosphere loses its transparency by the condensation of moisture, these stars lose their distinctive peculiarities. Their redness gradually becomes obscured, and they at last appear of a dull, unsatisfactory white.

2. The blue stars were Capella, Rigel, Bellatrix, Procyon and Spica. Some of these, as first Procyon, and then Rigel, are far more intensely blue than the others. But as the atmosphere becomes thick and more impervious to distinct vision, their different intensities of blue fade away, and the observer is at length puzzled to decide of what color these stars really are. He feels safest in announcing that they seem white, though not of a clear, decided whiteness.

3. The green stars were Sirius, Vega, Altair and Deneb, or the largest star in the Swan. These stars were observed to be green by myself, in the following order: Sirius in the autumn of 1862, Vega in June, 1863, and Altair and Deneb in August, 1863. It is remarkable that a very slight haziness in the sky completely hides their green color, and causes them to appear unmistakably blue. A still thicker haziness has the same effect on them as it has on all the blue stars already described, gradually obscuring their blue color, and ranking them among the many hundreds of stars which the naked eye cannot decide to be colored.

4. The yellow star was Arcturus; this being the only one which appears decidedly yellow to my vision, unaided by instruments. Several others incline the naked eye to regard them as yellow, such as Polaris and the larger stars of Ursa Major and of Cassiopeia, but not sufficiently so to produce a firm belief. Arcturus, in a clear sky, has a fine light orange yellow; but as the sky becomes less and less clear, the yellow fades away, and ultimately the color of this star turns to a dim white, and becomes undistinguishable from that of the larger stars of Ursa Major, with which, from their position, it may be handily compared.

5. The white stars were Regulus, Denebola, Fomalhaut, Polaris, the constellation of the Wagon, and several others of the second and third magnitudes. They may be called white stars with reference to their appearance to the naked eye, to mine at least, but we are not bound on that account to believe them to be really white. As they are not first magnitude stars, they probably seem white to the unaided eye only because their light is not sufficiently great in amount, or intense in color, to appear colored. There may be persons with unaided vision acute enough to perceive their true colors. But whatever may have been the conditions of the atmosphere, I have never observed them to be other than white. No changes of the air have had the power of presenting them in any shade as colored stars.

Thus the influence of the atmosphere of our earth upon the stars of all the different colors, according to these observations, is the same. Whether the stars be red, blue, green or yellow, the effect of changes in the atmosphere is to rob them of their peculiar shades and intensities, and to reduce them all to a dull colorless condition,—a dim whiteness, in which their indistinctness produces a feeling of uncertainty and doubt in the beholder. Nor in any case have I seen any change in the atmosphere turn a star from one color to another, except from green to blue, and this is simply reducing one shade to another; for green, like purple, is but one of the modifications of blue. I have never seen a red star become blue, nor a blue star become yellow, nor any other similar change by any change in the atmosphere. If such an occurrence were possible, I believe I would have observed it during the past two or three years. The effect of moonlight in obscuring the colors of the stars, and giving them a yellowish shade, can hardly be called an atmospheric action. Neither can the effect of the rays of the sun in the earliest daybreak of the morning or in the latest twilight of the evening, be called an atmospheric operation. Such an effect tends to impart a general whiteness to the stars, obliterating their colors in part or in whole, the same as in the end it obliterates all their light.

The question now arises, How is it that the atmosphere, when hazy and imperfectly transparent, has the power of depriving the stars of their colors, whatever their colors may be, and reducing them all alike to a dull whiteness? The reason may be seen in the simple fact of the obstruction of their light. Their light becomes diminished in amount to such a degree that it no longer has the power to produce the sensation of color on the retina. Nearly all the stars, when viewed through a telescope, are colored; they are of some hues other than white. Of this I adduced evidences in my communication for these Proceedings in June, 1863. They appear colored through the telescope because their light is collected by the instrument in a comparatively large mass; so large that it can make their colors readily perceived. Take away the instrument from all except the larger stars, and the pencil of light becomes so small as to be without the power of imparting the sensation of color. In the same manner the pencil of light from the larger stars may be reduced by haziness in the atmosphere to so small an amount as to be incapable of imparting the sensation of color, except a dull whiteness, whatever their real colors may be.

But how does it happen that a green star is changed by haziness to blue? I once thought that possibly this effect might be due to the same cause which makes the deep ocean, the distant mountainns, and even the atmosphere, appear blue. After further observation and reflection I cannot adopt that explanation; for then all the stars, like the distant mountains, would be colored blue. Then there would be no such contrasts of all colors among the stars as we now behold. The true explanation seems to be that the mists of the atmosphere, in acting on the light of a green star, first obstructs the yellow rays, and after these are all absorbed then the blue rays alone will be visible, and the star must appear blue. Ultimately the mist may become so impervious that the attenuated ray of light can no more excite the sensation of color and the star must appear dimly white.

Before it can be admitted as a scientific truth that the atmosphere of our earth has the power of changing the color of a fixed star from one hue of the rainbow to another totally different, there must be brought forward a number of well authenticated facts as grounds for such a belief. We must have the specifications of certain stars which have been seen to change, and the dates of such changes, and the conditions of the atmosphere by which such changes have been produced, and also the numbers and the names of the persons by whom such phenomena have been witnessed. Such evidences of the changes of the colors of the fixed stars by our atmosphere have never been seen nor heard, and for my part, judging by my own observations, I never expect to see them, nor to hear of them. An exception to this remark may be the case of a green star turning to blue, as already explained. Perhaps another exception may yet be found, as indicated in the following passage from Humboldt. The italics are not in the original: "We do not here allude to the change of color which accompanies scintillation, even in the whitest stars, and *still less to the transient and generally red color exhibited by stellar light near the horizon*, a phenomenon owing to the character of the atmospheric medium through which we see it, but to the white or colored stellar light radiated by each cosmical body, in consequence of its peculiar luminous process, and the different constitution of its surface. The Greek astronomers were acquainted with red stars only, while modern science has discovered, by the aid of the telescope, in the radiant fields of the starry heavens, as in the blossoms of flowering plants and in the metallic colors, almost all the gradations of the prismatic spectrum." The turn of the expression "still less" shows that he regarded the matter as inconspicuous and unimportant, and the remark is made only in a casual manner. Nevertheless, incidental as the remark may seem, it is the most precise and circumstantial I have found in any author on the influence of the atmosphere on the colors of the stars. But is it really true that the atmosphere can impart a transient and generally red color to stellar light when near the horizon? In the absence of all confirmation to the above remark of the distinguished philosopher, I selected as test stars Vega and Capella, both first magnitude stars, the former green and the latter blue, and the one or the other is grazing the northern horizon nearly all the year. But I have been unable to detect the changes he mentions. May not his remark have arisen from observations on the planetary bodies, and have been inadvertently extended to the fixed stars? The planets, especially Jupiter, according to my observations, are sometimes, though rarely, sensibly reddened like the sun and moon by the atmosphere. But whether Humboldt's assertion be confirmed or not, it cannot effect our decision about the real changes of the colors of the stars. No one would pretend to announce a change in the color of a star simply because of a "transient" appearance of a change while near the horizon. In the same manner, probably, the idea has got afloat in a vague manner that, because the atmosphere of our earth has the capability of giving occasionally a red color to the sun, moon and the planets, it must therefore have not only the same effect on the fixed stars, but even the power to turn them to all the hues of the spectrum between red and blue. But this rapid generalization is no more warranted by sound reasoning than by observation. The sun, the moon and the planets have sensible disks, which the fixed stars have not. Hence the optical phenomena of these two classes of bodies differ widely. The fixed stars, under the influence of our atmosphere, are made to scintillate; they then twinkle with an unsteady light, and to good eyes they flash out rapidly and fitfully all the varieties of colors. This shows the difference, in an optical point of view, between the fixed stars and the other celestial bodies, and the impropriety of a hasty generalization from one class to the other. Because the atmosphere can redden one class it by no means follows that it can redden the other, much less that it can impart to the other all imaginable hues.

Another cause for the belief that the atmosphere can impart different colors to the stars, may be found in the necessity for some explanation of their changes of color. It is assumed, though without any known reason, that the intrinsic colors of the stars cannot change, at least in the space of two thousand years, and hence there is a necessity for an explanation of their apparent changes in some other way; and as the handiest method these changes are attributed to the atmosphere of our earth. That the various colors of the stars are not produced by our atmosphere, nor by optical instruments, nor by personal peculiarities of vision, becomes perfectly evident from the following simple consideration. If their colors were produced by any one of these causes, then there would not be that beautiful contrast of colors which we now behold; then it could never have been said of the cluster Kappa Crucis, that the various bright contrasted colors of its different members give it all "the effect of a superb piece of fancy jewelry." Instead of this there would be in that cluster, and in every other region, a dull monotonous color in all the stars alike. It has happened that travellers, in coming from Europe to America, have expressed their surprise at the beauty of our sky, when noticing for the first time in their lives the different colors of the stars. This has been supposed to be the work of our atmosphere, the natural operation of the gaseous envelope of our earth. The true explanation is this. The stars appear colored to the naked eye in Europe as well as in America. Astronomical observers see them colored the same in all countries. But in some countries their colors are slightly dimmed by the more habitual haziness of the atmosphere, so much dimmed that they are not noticed by unprofessional gazers. When these latter persons arrive in a more cloudless region, they notice the colors of the stars simply because a slight veil is withdrawn, and not because new colors have been added.

The evidences of changes of color are now most abundant among the double and multiple stars. This is because the colors of these have been more generally recorded. Hence the importance of having records made, as frequently as possible, of the colors of all the stars, as they appear both to the aided and the unaided vision. Of course no careful observer will decide on the color of a star from its appearance in an unfavorable atmosphere, nor will he neglect the influence of the sun and moon, nor other means for correcting and confirming his observations, as presented in the rules of my last paper.*

July 5*th.*

Dr. Coates in the Chair.

Eight members present.

July 12*th.*

Vice-President **Bridges** in the Chair.

Eleven members present.

A paper was offered for publication entitled "Description of a Gar-Pike, supposed to be new." By Alexander Winchell.

July 19*th.*

Vice-President **Bridges** in the Chair.

Ten members present.

A paper was offered for publication entitled "Contributions to the Herpetology of Tropical America." By E. D. Cope.

The death of Thomas Dunlap, member of the Academy, on the 11th instant, was announced.

July 26*th.*

Vice-President **Bridges** in the Chair.

Six members present.

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* Page 57 of this volume.

August 23d.

Dr. McEuen in the Chair.

Seven members present.

A paper was presented for publication entitled "On the Limits and Relations of the Raniformes." By E. D. Cope.

August 30th.

Dr. McEuen in the Chair.

Twelve members present.

On report of the respective Committees, the following papers were ordered to be published:

Contributions to the Herpetology of Tropical America.

BY E. D. COPE.

Caudisona basilisca.

Two pairs of symmetrical muzzle plates in contact; third or posterior pair subdivided. Rostral subtriangular, higher than wide, in immediate contact with nasals and frontals. Oblique length of postnasal equal horizontal length of prenasal; latter separated by small scales from the anterior labials. Fourteen superior labials, separated from the suborbital series by two and three rows of scales. Three flat plates between the elongate, flat superciliaries. Temporals smooth. Scales in twenty-nine rows, external largest, and with two next on each side smooth. Tail stout, surrounded by thirteen longitudinal rows at the middle. Rattle very acuminate, with a lateral groove. Gastrosteges 199; urosteges 20 single, four terminal divided. End of muzzle to rictus 1 in. 10 l., to vent 44 in. 8 l.; vent to base of rattle 3 in. 1 l.

Ground color pale yellowish brown, much replaced by the following markings, which are on entire scales, not parts: about thirty dorsal rhombs from a short distance posterior to head to opposite vent, of a bright chestnut red, browner medially and white bordered; five scales long and fourteen wide inside the white border, on the median part of the body, where they are in contact. Posteriorly they are separated, anteriorly elongate. Laterally, between each rhomb, a spot of bright chestnut. Belly and inferior scales yellow, every second or third lateral the base of a short oblique chestnut band. Head dark brown; two elongate occipital spots. Superior labials yellowish. A narrow yellowish line from the small eye to the rictus. No lines on the neck. Tail dark grey, with five obscure rings.

Hab.—Near Colima, Mexico. From Consul John Xantus' collections. Mus. Smithsonian, No. 6118.

This species belongs in the section embracing the South American species, and the C. molossus, from all which it is quickly distinguishable. It has fewer labials and more scales below the eye than molossus, and possesses a different pattern of coloration, though the tints are nearly the same. The affinities with adamanteus and atrox are not distant; the plates of the muzzle and coloration are different.

Crotalus triseriatus Wagler (Uropsophus Wagl., *Crot. lugubris* Jan,) is not rare on the Mexican Table land. It is allied to C. lucifer, but especially to C. scutulata Kenn.

Tomodon nasutus.

Body cylindrical, stout; neck but little constricted; head acuminate oval.

Muzzle produced beyond the labial margin, oblique-truncate in profile. Rostral plate flat, not turned backward above. Both pre- and postfrontals longer than wide, the latter a little bent down laterally. Vertical more than twice as long as wide, lateral outlines not straight. Superciliaries broad; occipitals rather short, longer than broad; two postoculars, in contact with one temporal. One preocular just touching vertical; one longitudinal loreal, higher behind; one elongate nasal, the nostril anterior to its middle and connected by a suture to the margin below. Superior labials eight, third, fourth and fifth entering orbit; inferior ten; post- longer than pregeneials. Anterior maxillary and mandibular teeth longer than median. Pupil round. Scales broad, thin, poreless, in nineteen rows. Tail rather slender. Gastrosteges 186; one divided anal; urosteges 67. End of muzzle to rictus oris 7 lines, to vent 6 in. 2 l.; tail 4 in. 5 l.

General color light brown, punctulate with dark brown, especially thickly on head and sides. A darker brown band three and two half scales wide from occiput to end of tail, which is nearly broken into spots on the nape. Ends of scuta and first two rows of scales darker, especially anteriorly, where the band is sooty and spreads over the lips and chin; a faint longitudinal band above the shade; a short yellow streak from postorbitals to penultimate labial. Abdomen with many short punctulate streaks.

Hab.—Colima, Mexico. Xantus coll. No. 1341. Besides the preceding, this very fine collection contained Spilotes auribundus (=*salvini* Gthr.), S. erebennus (*obsoletus* Holbr.) Conophis lineatus, Phimothyra mexicana (*Zamenis* D. & B.) and the following:

Toluca frontalis.

Muzzle prominent, acuminate, slightly recurved. Rostral separating prefrontals very slightly. Nasal long; postfrontal in contact with second superior labial. One narrow low preocular, two postoculars, the lower barely in contact with one temporal. Seven superior labials; eye over third and fourth. Occipitals longer than vertical, truncate, rounded behind; anterior suture of vertical a little longer than straight lateral. Seventeen rows of equal thin scales. Seven inferior labials; geneials very short, posterior pair reduced to scales. Urosteges 44; one double anal; gastrosteges 141. End of muzzle to canthus oris 8 lin.; to vent 8 in. 10 lin. Length of tail 1 in. 10 lines.

Color below uniform pale yellow. Above grayish brown, becoming more rufous medially, with about thirty-six rhombic, dark edged, brown spots, six scales wide and four long, whose angles are produced as vertical lateral bars. Together they become nearly cross-bands posteriorly, when they are separated by a pale spot on the vertebral line. A brown cross-band across postfrontals and vertical; a longitudinal band on each occipital and side of nape.

Hab.—Colima. Xantus coll., No. 1363.

In this genus and Tomodon the hypapophyses of the vertebræ are, as usual among the Asinea, not developed behind the anterior fifth or sixth of the column. A group of genera partly coinciding with that forming Jan's family Potamophilidæ, I find to possess these processes even to the vent, offering a new character of definition to the subfamily of the Homalopsinæ, as they may be called. The genera in which this structure exists are Eurostus D. and B., Gerarda Gr., Hypsirhina Wagl., Cerberus Cuv., Homalopsis Kuhl., Helicops Wagl., Atretium Cope, Tachynectes Fitz., (this genus is coryphodont in dentition; T. chrysostictus is a Helicops); Tropidonotus Kuhl., Thamnophis Fitz., Xenochrophis Gthr., (= *Thamnosophis* Jan), Prymnomiodon Cope, Ninia B. and G., Storeria B. and G., Haldea B. and G., Tropidoclonium Cope, Amastridium Cope. In Herpeton the processes are present, but very weak for a short distance posteriorly. In Tretanorhinus, otherwise similar to this group, there are only strong keels, as in a few Colubrine genera. Glaniolestes and Heterodon do not belong here; the processes are wanting; so also with Xenodon and Thamnodynastes. Hydrops and Calopisma belong to another section.

Pseudaspis cana (Coronella Auct.) differs widely from the Coronelline genera in the strong posterior development of these hypapophyses, resembling Lamprophis aurora, which separates itself by this from the Lycodonta, where it has been erroneously placed.

Chamaeleolis porcus.

Height from superciliary margin to mandibular edge enters two and two-third times in length from end of muzzle to end of casque, (3½ times in fernandina); width of muzzle at middle 2⅔ times in length from its end to the posterior border of orbit; (3 times in fernandina). Casque rather abruptly turned upwards. Labials nearly square, separated by but one row of large scales, from orbit. Inferior labials short, in contact below throughout with a row of ten more or less quadrangular infralabials, which are again margined by another row of longitudinal infralabials. Thickened margin of fan prolonged to symphysis, bearing a double row of long beard-like appendages. Scales of throat and fan minute, uniform, smaller than abdominal; the last tubercular, larger than in fernandina. Dorsal scales large, subquadrate, in seventeen transverse rows from axilla to groin; (28 in fernandina); in nine larger, and six very narrow dorsal series, separated by narrow, granular interspaces. Dorsal and caudal median fold well developed. End of muzzle to ear 2 in.; ear to vent 4 in. 2 l.; vent to end of tail 6 in. 10 l.; anterior limb 2 in. 3 l.; posterior limb 3 in. 1 l.

Color of a ♀ specimen long preserved in alcohol: A general yellowish gray, with five pairs of faint brown bands across the dorsal crest, and a large brown patch, on the anterior half of each side. Head with numerous black spots.

Cuba. Mus. Acad. Nat. Sci. Phila. One specimen from Dr. Gavin Watson. This species is stouter and shorter than the fernandina,* and differs much in the scutellation. It agrees with it in some minor points, as the temporal ridge, the process above the auricular opening, etc.

Eupristis baleatus.

Scales all keeled, but little larger than smooth abdominals, separated and surrounded by granulations anteriorly. Scales of nuchal crest narrow, conic; of dorsal weak posteriorly. Very faint ridges on goitre, but every where a clothing of fine scales. Convergent ridges of occiput not distinct. Front tuberculous, two parallel lines running down the middle to end of muzzle, slightly concave between superciliary ridges. Canthus rostralis tuberculous; no occipital or supra temporal tubercles. Seven loreal rows; brachials larger than dorsals; antebrachials and many femorals two and three keeled. Four infralabials larger, the anterior not the largest. Below yellowish, posterior extremities and tail much marbled with brown. Above brown, with three greenish white cross-bands, which are broadest and turned backward on the median line; traces of intermediate bands are seen on the inferior part of the sides. The anterior is broken into spots, and two spots on the nape are opposite to two longitudinal pale shades on each side the neck. Head uniform brown; a light spot on lower scapular region. Brachium with two, antebrachium with four, femur and tibia each with three cross-bands of greenish white. Tail with numerous broad bands. Toes cross-banded. From end of muzzle to tympanic orifice (French measure) 4″ 5‴; from tympanum to opposite vent 11″ 4‴; vent to end of tail (broken) 26″. Anterior extremity 6″ 3‴; posterior 10″ 3‴.

Hab.—St. Domingo. Mus. Brittann.; (from Sallé's collection.)

Xiphosurus ferreus.

A double nuchal crest. Dorsal and lateral scales large, keeled. Supra temporal swelling covered with large tuberculiform scales. Superciliaries in contact; frontals large, smooth. Canthus rostralis higher than frontal ridge, sharp, elevated, bordered by four scales, the three anterior of which are in close contact with those of the frontal ridges, which are three, and are separated by two rows of large flat scales. Superciliaries five on each side, all transverse except the anterior, but one on each side in contact. Occipital large, oval, separated from superciliaries by one row, in a deep depression. Supraocular patch of four or five transverse scales of an inner series, and two or three round of an outer. Loreal rows five. Goitre small, covered with close series of produced oppendiciform scales. Symphyseals produced posteriorly. Two large anterior infralabials. Femoral scales larger; brachials, tibials and antebrachials equal to ventral, all weakly keeled. Dorsal little, lateral much smaller, strongly keeled. Scales of caudal crest larger than those of sides of tail. Muzzle to ear 3″ 4‴; ear to vent 8″ 2‴; vent to end of tail 19″.

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* For a beautiful specimen of this animal I am again indebted to my friend Prof. Ph. Poey.

Above dark brown, blackish on sides of head; below metallic green shaded with brown; under surfaces of tail and extremities pale brown.

Hab.—" Guadaloupe." Mus. Britt.

Xiphosurus homolechis.

No nuchal crest, a slight fold. Four larger dorsal rows of keeled scales—fold none, or indistinct. Supra temporal and lateral scales minute. Superciliaries separate; frontals equal, keeled. Supraorbital patch separated by a row of small scales from superciliaries. Canthus rostralis lower than frontal ridge.

Head short, muzzle acuminate; canthus rostralis sharp, a little decurved, its scales separated from those of the frontal ridge by one row of scales. Scales of front and muzzle nearly equal, as broad as long, keeled. Six superciliaries on each side, longer than broad. Occipital small, not in a depression, separated from superciliaries by many rows of scales. Goitre large. Three rows of subhexagonal scales in supraorbital disc, separated from superciliaries by one row of small scales. Lateral scales granular. Scales of caudal crest equal, lateral caudal; those of extremities larger than ventrals. Muzzle to ear 1″ 4‴; ear to vent 3″ 3‴. Anterior extremity 2″; posterior 3″ 6‴.

General color brown, darker on nape and temporal region; below whitish, with green metallic shades, and indistinct brown variations posteriorly. Tail and extremities pale brown beneath.

Hab.—West Indies—the island unknown. One specimen, Mus. Britt.

Anolis Section.[*] *Tail compressed, or with a median larger series of scales; ventrals smooth.*

Anolis damulus.

Six superciliaries, nearly equilateral, except the anterior, which is very large, separated by one row of smaller scales; four rows between the anterior of the facial ridges, weakly keeled. Supraorbital disk of about 14 keeled scales, isolated. Occipital small, separated by many rows of small scales. Rostral plate emarginate above; nostril quite terminal, lateral. Five loreal rows. Symphyseals broader than long; three larger anterior infralabials—two anterior broader than inferior labials. Dorsal scales very small, equal; ventrals larger than brachials, which are keeled; infratibials smooth. Ear much smaller than fissure of eye, larger than nostril. Anterior extremity reaching beyond groin; posterior to anterior border of orbit. Tail nearly cylindrical, of moderate length; all its scales strongly keeled. A shoulder fold. End of muzzle to anterior border of orbit 6‴; between the latter points 5‴; muzzle to ear 1″ 3‴; ear to vent 3″; tail 7″ 5″. Anterior extremity 2″; posterior 3″ 3‴.

Above metallic light reddish brown, with some minute glistening white points on the sides. Head above paler, lips varied with darker, a pale streak from below eye to ear. Limbs spotted, behind marbled with silvery, dark and light colors abruptly separated on posterior face of femur, which with the abdomen are pale golden below; gular region faintly greenish; chin brown, varied. Tail brown, cross-banded near the end.

Anolis gingivinus.

Head elongate; from end of muzzle to auricular opening twice into length from posterior margin ear to posterior face femur. Muzzle rather narrow, end rounded and truncate in profile. Canthus rostralis straight, acute. Loreal region a little concave, with five (4) rows of scales, its greatest height half frontal width between last scales of canthus rostralis; latter distance equal from same point to top of rostral plate. Two pronounced frontal ridges not continued on anterior part of muzzle; concavity pronounced, elongate, enclosing two rows of smooth scales at middle portion, bordered by two large subequal scales in front of last superciliary; between anterior of these are three rows of scales, of which the median is often large. Posterior scales of canthus rostralis much larger than second. Superciliaries four or five, in contact, sometimes nearly separated by a row of granules. Supraorbital disc separated by only one row of granules from superciliaries. Occipital well developed, surrounded by numerous flat scales, in a strong depression. Symphyseals large, first infralabial a little smaller, like the second larger than any labials, and preceding an infralabial series of oblique scales. Ear equals half eye. A faint nuchal fold; two rows of larger median dorsal scales, less than brachials; laterals very minute. Ventrals oval, much larger than dorsals or brachials, smaller than supraorbitals. Fan elongate, moderately developed. Tail moderate, strongly compressed, with a strong crest of scales, of which every third is larger and the summit of a cross series. Ramus mandibuli in most specimens thickened in a vertical direction, forming a strong inferior ridge. Posterior limbs short. From end of muzzle to ear opening 1″ 9‴; from latter to vent 4″ 4‴; anterior limb 2″ 7‴; posterior to heel 2″ 7‴; foot 2″.

Above greyish or rusty brown, with darker, rather close vermiculations on the sides, which form a dark superior border to a broad pale band from above axilla to groin. This is bordered below by brown, below which are other dark vermiculations. Inferior surfaces, including fan, immaculate. ♀ is similar, except in the absence of the dark markings not bordering the lateral band.

Six specimens from Anguilla Rock, near Trinidad; presented by W. J. Cooper to the British Museum.

Anolis citrinellus.

Muzzle of medium outline, slightly depressed and rounded at extremity, less than twice as wide between lachrymal angles than loreal height, but twice as long from same point. Canthus rostralis straight, the posterior scale largest, the fourth under the lateral nostril. Facial ridges not strong, higher than canthus, each with two large scales in front of first and large superciliary, and enclosing three rows of smaller, flat, smooth scales, which are broad as long, the two outer larger than the median. Superciliaries large, four on each side, in contact, nearly separated by a row of minute scales, and separated from the round occipital by three rows of scales. Supraorbital disc touching or not touching supraorbitals, two larger and six smaller, the inner anterior longer than broad, three times the size of second. Five rows of loreals. Three anterior infralabials larger than labials, the anterior less than symphyseal. Auricular opening two-thirds of ocular. Fan elongate, rather closely scaled. Abdominal scales about equal middle interrugal and brachial; some of the thoracic keeled. Anterior femoral larger, very weakly keeled; inferior tibials and antebrachials more strongly. Two median dorsal rows larger keeled, much less than abdominals; other dorsals and laterals minute, but rather coarse and tuberculiform. Tail but moderately compressed, with a low crest. End of muzzle to ear 1″ 1½‴; ear to vent 3″; vent to end of tail 7″ 5‴. Anterior extremity 1″ 5½‴. Posterior to heel 1″ 6‴; hind foot 1″ 4‴.

Above dark brown, nape, vertebral line, and about five broad transverse cross bars on each side darker, the space between tinged with yellowish. Below bright yellow, gular region greyish, with some faint longitudinal brown lines; chin, labial and rostral shields yellow, or tinged with it. Extremities dark, with a few very faint cross bars.

Hab.—Hayti. Mus. Britt.

** *Tail cylindrical, or with vertebral and lateral scales equal; ventrals keeled.*

Anolis carneus.

Scales everywhere flat and smaller than frontal. Head short, broad, especially occiput. Front narrow, concave, superciliary rows separated by two or three rows of scales. Superciliaries nine or ten, not wider than long, not continued as a large row on facial ridges, which are high, rounded, enclosing deep concavity, which is filled with equal subhexagonal scales, smooth or slightly one-keeled. Canthus rostralis sharp, short, descending steeply; nostrils lateral, eight or ten rows of narrow scales between. Occipital small, surrounded by nearly equal scales, which a little exceed the smooth dorsal. Eye large; eight loreal rows. Many rows of keeled infralabials, scarcely larger than gulars. No whorls among tail scales, which are very weakly keeled. Ear nearly as large as eye slit. Supraorbitals weakly keeled, in five rows, not forming an isolated disc. From ear to end of muzzle 3¾ times from latter point to vent, in an old ♀ specimen, four times in a young ♂. No dermal dorsal fold. 9″ 5‴ from muzzle to vent; tail 16″; groin to heel 5″; hind foot 3″ 5‴; anterior-limb 4″—all from ♀, which is light yellowish brown above; a pink shaded median dorsal band, on each side of which is a narrow brown band, which commence by two convergent portions on occiput, and are interrupted behind opposite axilla; two or three other more or less interrupted paler brown streaks on each side. Brown band between eyes. Beneath immaculate. Young ♂ every where rose colored, with some blackish markings on posterior part of sides, and faint bands across hind and fore limbs. Goitre very small.

Two specimens in Mus. Britt. Lower Vera Paz Forest. Obtained from Osbert Salvin, a thorough explorer of that region.

A. semilineatus.

Near to cyanopleurus; agreeing in most points in squamation; but instead of six or seven there are 10—12 rows of larger dorsals; 2—3 larger smooth infralabials; front scales broad as long, smooth, six rows from canthus row to canthus row at half way to nares. A triangular patch of scales as large as loreals behind the eye, which are abruptly surrounded by the minute lateral.

A brown shade from lores to middle of side; yellow band from supralabial line to middle of side or groin, which is bounded above and below by a dark shade. Size, that of cyanopleurus.

Hab.—Hayti. Mus. Brit.

Anolis bitectus.

Muzzle acuminate, with scales broad as long, 1—3 keeled, those between ridge rows much smaller, minute, yet flat, one row between the double rowed superciliaries. Occiput oval, surrounded by small scales. Two rows of rather broad keeled supraorbitals. Ear ⅓ of eye; seven loreal rows; canthus rostralis short, nearly straight. Infra-maxillary small, equal, keeled. Minute scales from eye along side; nine larger dorsal rows, then two median size each side, then lateral. About eighteen rows of ventrals. Male with well developed goitre. Tail rather short. From end of muzzle to ear 1″ 3‴; to vent 5″ 2‴; hind foot 2″; heel to groin 2″ 7‴.

Above light brown, below and on upper tip yellowish, abruptly separated from color of upper surfaces, which is on sides a dark band from eye, extending in ♀ only to groin, and is bordered below with distinctly paler to middle of side.

Two specimens. West Equador. From Fraser's collection.

Anolis scypheus,

Lateral scales minutely granular, graduating into larger, many rowed, keeled dorsals, which are very much less than ventrals, and less than frontals. Superciliary row not continued as larger scales to canthus, composed of nine scales, separated by three rows of keeled scales; twelve rows at middle of muzzle between canthus rows, as broad as long, obtusely one-keeled. Canthus rostralis descending steeply, nearly straight, from lachrymal processes to same, equal from same to end of muzzle, and longitudinal diameter of orbit. No prefrontal concavity. Frontal and occipital region elevated. Eight loreal rows. Supraorbitals very small, on inner part of the region, in longitudinal series, keeled; rest of surface granular. Occipital not large, surrounded by many flat scales, and between two bony crests, which unite posteriorly to it, send off a posterior median crest, which after 2″ length, sends off a nearly transverse branch on each side. Ear ¼ size of eye opening. Infralabials small, longitudinally keeled. Keeled scales of limbs *much* smaller than abdominal; caudals very small, equal at root of tail. Trace of goitre in ♀. Digital dilitations very narrow. From end of muzzle to ear 1″ 6‴; to vent 6″ 8‴; vent to end of tail 11″ 2‴; hind foot 2″ 6‴; groin to heel 3″ 8‴.

Bright green; brown band across muzzle and eyelids, and some small white specks. Narrow blackish cross-bands directed forward on sides, and longitudinal reticulations from axilla. Femur? twice, tibia once brown crossbanded. Immaculate below; throat bluish.

Anolis ustus.

Resembles superficially alutaceus and damulus. Head flattened; muzzle acuminate; greatest width between posterior scales of canthus rostralis from same point to anterior margin of nostril, which is lateral, and near end of muzzle. Ridges scarcely perceptible; concavity shallow, broad, three scales wide. Scales of front broad as long, slightly one-keeled, in six or seven rows between canthus; five rather large superciliaries which are in contact, or separated by one row of very small scales; occipital large, surrounded by flat scales; supraorbitals five or six; three broad, smooth on inner row, in contact with superciliaries, except on one side of one specimen. Dorsal scales smaller than caudal, ventral or prefemoral. Five loreal rows; canthus nearly straight; ear ¼ of eye; dilatations well developed; goitre weak. Infralabials few, small, shorter anteriorly. Tail a trifle more than twice head and body; muzzle to ear 1″ 2‴; ear to vent 2″ 9‴.

Yellowish brown, with several short, irregular, darker, lighter bordered, half-fasciæ above. Head darker above; streak across between eyes. Gular and lateral regions with ferruginous small spots and shades. Tail with transverse dark shades. Extremities darker, paler, few cross banded.

Two specimens. B. M. Belize.

Anolis heliactin.

Size small; head large, elongate, depressed; ridges weak; concavity shallow, short; fourteen more or less rows of narrow, keeled, not imbricate dorsal scales which graduate into the granular lateral, and are smaller than the imbricate ventral: the last about equal to those on the middle of the front. Interrugal scale shield-like, broad as long, faintly keeled; a little larger than those of the ridges: these are continued as a row to the middle of the canthus rostralis, and number nine scales from that point to posterior extremity behind orbit; they are separated by two rows of small scales, and two on each side from the round flat occipital; also by one row from supraorbital disc. Six superior labials; five loreal rows. Disc composed of two rows of broad scales; the inner larger, keeled. Infralabials longitudinal, smaller than labials. Fan large. Ear one-third of eye fissure. Nostrils opening laterally. Femur and tibia of moderate length. Tail very long; its scales larger than dorsal or ventral. Knee and elbows not meeting on the side by the length of the humerus; heel not reaching axilla, longest toe posterior part of orbit. Digital dilatations narrow. Muzzle to ear enters three and one-half times into from muzzle to between femora. Pale yellow, with faint coppery and green reflections. Head tinged with brown; labial plates whitish.

Hab.—"Mexico." Mus. Academy Natural Sciences of Philadelphia.

Anolis nannodes.

Very slight concavity on muzzle; ridges low; scales of front broad as long, smooth or slightly roughened. Superciliaries in contact; small flat scales round the occipital. Dorsal scales very much smaller than those of front, and equal abdominal; seven or nine rows in the middle a little larger. Infralabials numerous, little distinct, equal, keeled. Loreals four or five rows; canthus rostralis nearly straight from angle of eye; eight rows between canthal rows at middle muzzle. Ear ½ size of eye opening. Eye not prominent. Two rows supraorbitals; inner much larger; four or five transverse in curved series separated by granular scales from superciliaries. Tail and extremities short; digital dilatations broad. End of muzzle to tympanum 1″ 2‴; former to vent 4″ 5‴; hind foot 1″ 1‴; limb 2″ 5‴; tail 7″.

Light reddish brown, with a brown cross band between eyes and across muzzle, and spot on each side of sacral region. The male with indistinct brown cross lines on back; female a darker median shade, and indistinct blackish line on each side.

Three specimens, two from Godman and Salvin's collection from Coban, Vera Paz, Mus. Brit. Sp. 6116 Mus. Smiths., Arriba, Costa Rica, from C. N. Riotte, and No. 6117 Xalapa, De Oca.

Anolis crassulus.

Differs from *sallei* in larger ventral and dorsal scales; in smoother, broader scales of front, especially superciliaries and supraorbitals. More numerous supraorbitals; shorter muzzle, a few larger, smoother infralabials. Differs from *nebulosus* in number and separation of superciliaries and in supraorbitals, apparently.

Eyes rather small; muzzle not long, not short, rounded acuminate, a little depressed at tip. Frontal depression strong, containing five or six scales, counting across its anterior part. Superciliaries as broad as long, separated by one or two rows (in one specimen in contact, perhaps abnormally); eight from canthus rostralis to point nearest occipital; all scales of front smooth, thick, as broad as long. Two rows broad subhexagonal supraorbitals, four or five broader on inner row, forming a disc not surrounded by granules. Two or three outer infralabials equal inferior labials. Goitre well developed. Four loreal rows: 13—14 rows of dorsals graduating rather suddenly into laterals; a little smaller than ventrals and prefemorals. Tail stout at base. Ear ½—⅓ eye slit. Pale reddish brown, below yellower; top of head darker; front loreal region through eye along each side of neck a brown indistinct band, bounded below by a narrow yellowish one from whole labial length, which is prolonged posteriorly. ♀ with a yellow dorsal band. End of muzzle to ear 1″ 4‴, to vent 4″ 7‴; hind foot 1″ 7‴; heel to groin 2″; tail 9″.

Two specimens. Coban, Vera Paz. "Central America." Mus. Brit. Sp. in Mus. Smithsonian and Acad. Nat. Sci.

Anolis cymbops.

Width of head between temporal ridges equal to its perpendicular diameter at occipital plate; muzzle rather short, acuminate; loreal region straight, high; canthus rostralis straight, steep; muzzle swollen between nostrils; no facial ridges, but a well marked, broad concavity. Eyes large; palpebra projecting upwards, with a supraorbital disc of three rows of keeled scales, which are longer than broad. Seven rows of loreals; superciliaries six or seven, separated by one row of scales of nearly equal size; four rows between continuation of superciliary rows, but all of nearly equal size, broad as long, some keeled; eight scales across middle of muzzle; on end of muzzle smaller. Two rows of scales (suboculars divided) between orbit and superior labials. Labials $\frac{11}{13}$. Symphyseal posteriorly convex in outlines, infralabial small, subequal, keeled. Occiput small, surrounded by numerous flat scales. Abdominal scales smaller than those of front, obtusely keeled. Laterals and dorsals granular, minute, gradually a little larger dorsally, but less than two median rows, which extend from nape to on tail, which are keeled and smaller than the abdominal. Exterior scales of extremities larger, keeled. Digital dilatations not broad. Hind limb extended, reaches to middle of lores. Tail slightly compressed; scales at base smaller, flat, keeled; two meridian rows larger. End of muzzle to ear 1″ 1‴; ear to vent 2″ 9‴; vent to end of tail 6″; anterior extremity 1″ 7‴; posterior to heel 1″ 9½‴; hind foot 1″ 4½‴.

Above brown, outer edges of the two median dorsal rows much darker; a cross band on tibia; below yellowish brown, rather closely shaded with reddish brown, especially posterially and on extremities. A dark shade in front of each inguinal region.

One sp. ♀. Vera Cruz.

*** *Tail cylindrical, without crest, or covered above with equal scales: ventrals smooth.*

Anolis **impetigosus**.

Muzzle elongate acuminate, depressed, rugæ obsolete; concavity shallow, elongate rhombic; nostrils terminal; canthus rostralis not prominent. Scales of front large, smooth, polygonal, as long as broad, anteriorly a middle series separated by smaller ones from those of the canthus rostralis. Two large broad plates between canthus rostralis and end of superciliary series. Latter in contact medially, separated from the small occipital, which is surrounded by flat subhexagonal scales, where they can be seen. Two bony ridges, converging from the posterior part of the superciliaries, meet on the median line, and project a short mucro, which is a little behind above the auricular opening. Between these, as far as the narrow frontal region, the head is roughened by minute exostoses. Supraorbital disc small, in contact with the superciliaries, composed of three large inner and one small outer scales. Loreal rows two; auricular opening little more than half ocular. Abdominal scales larger than dorsal, considerably larger than those of the front. Dorsal, lateral and longest extremital equal, smooth, flat, not regularly arranged; epidermis minute, scales of tail smaller than dorsal, except four median inferior rows, which are keeled and nearly as large as those of front. Symphyseals longer than broad, slightly divaricating posteriorly. Eight inferior labials bounded below by one row of infralabials anteriorly, and two rows posteriorly; the former larger than the labials, longitudinal. Gular fan large. Extremities short; tail a little longer than head and body, terminally compressed. End of muzzle to ear 1″ 3‴; ear to vent 3″ 10‴; tail 6″. Anterior limb 1″ 5‴; posterior 2″ 3‴.

Above and laterally very pale brown, with numerous short, darker, longitudinally arranged streaks; tail with a reddish tint. Below pale yellow; gular fan with many large black spots.

Habitat.—Unknown. One specimen. B. M.

Anolis **gibbiceps**.

Short and stout; head broad and square posteriorly, short acuminate anteriorly; canthus rostralis elevated, little concave; frontal concavity well-marked, not contracted anteriorly. Eyes and ears large, orifice of latter one-half that of former. Nostrils lateral terminal. Loreal scales small, eight-rowed; muzzle and front scales longer than broad, striate, and sometimes one-keeled, of equal size, in nine longitudinal rows across middle of muzzle; superciliaries eight, a little broader than long, separated by three rows of scales. Supraorbital disc surrounded by smaller *scales*, and composed of six or seven elongate, keeled scales. Occipital small, surrounded by small, equal, rough scales. Infralabials small, equal, numerous, keeled; antebrachial and prefemoral keeled scales larger than abdominals. Laterals and dorsals small, graniform or carinate; two or three median rows a little larger, less than abdominals, strongly keeled. Scales round base of tail equal, keeled, as large as antebrachial. Muzzle to ear 1″ 4‴; between temporal ridges 9‴; muzzle to vent 3″ 9‴. Anterior extremity 2″ 4‴. Groin to heel 2″ 6‴; heel to end digit 2″.

Above bronze brown, the head browner, the tail redder; below pale metallic ferruginous with green reflections; no regular or distinct lines or spots.

One ♀ specimen from Caraccas, with trace of gular fan, in Mus. Brit.

**** *Tail compressed, or with a crest of compressed vertebral scales; ventrals carinate.*

Anolis ordinatus.

Head broad, subacuminate, depressed at end of muzzle, from which point to middle of marginal supraorbitals equal between two latter points. Canthus rostralis a little convex. Only one *large* scale on frontal ruga in front of last superciliary. Front and muzzle scales longer than broad, one-keeled, in regular longitudinal series, not imbricate; six rows between nares, (lateral subterminal) of which the four middle are equal; five loreal rows, labials five or six. Only one large infralabial. Occipital surrounded by small scales. Supraorbital disc nearly or quite isolated, each scale keeled, as broad as long, three larger in inner series. Auricular opening half ocular; fan well developed. A slight dorsal nuchal fold. Scales of the extremities keeled; of femur largest, larger than abdominal. A few dorsal scales gradually larger, especially two median, which are weakly keeled. Tail much compressed; scales at base minute. Trace of rhombic occiput depression. End of muzzle to ear 1″ 4‴; ear to vent 4″ 3‴. Anterior limb 2″; posterior to heel 2″ 2‴; foot 1″ 8‴.

Yellowish brown, or a series of light small spots on each side of back, bordered with dark brown; and some vertical series of larger confluent similar spots, dark bordered. ♀ with a pale greenish median dorsal band not laterally defined, but bounded between femora and on base of tail by two large brown spots on each side.

Two specimens, ♂ ♀. "W. Indies."

Anolis alliaceus.

Near leachii, but with larger frontal plates and weaker face ridges, etc. Four rows in the almost flat front cavity smaller than three or four polygonals between terminal scales of front ridge rows; of these there are three—two lying along canthus. Six rows between lateral nostrils. One row between superciliaries, which are broader than long, and one row of granules between lateral and supraorbital disc. Some swollen scales round occipital, four (five) loreal rows; between posterior scales of canthus rostralis equal from same to end of muzzle. Ear two-thirds of eye. Symphyseals very large, larger than first infralabial, second larger than inferior labials; third infralabial large. Lateral scales minute, rough, scarcely smaller than dorsals, except two median rows of larger keeled, which are less than the keeled equal brachials, which are less than weakly keeled oval abdominals, which are less than keeled prefemorals. A slight fold on nape. Four large inferior caudals. Dilatations not narrow. Fan not very extensile, elongate. End of muzzle to ear 2¼ times in from ear to groin. Large row of equal caudal crest scales. Laterals small, keeled; four inferior rows large.

Bright dark bluish-green, with coarser or finer black vermiculations on neck, nape, gular and scapular regions. An elongate, black, light-edged spot above axilla, on each side interscapular region, and one or two each side of nape. Head above, anterior to line connecting angles of mouth, pale brown. End of muzzle to ear 1′′ 9′′′; ear to vent 4′′ 7′′′. Anterior limb 3′′ 3′′′; posterior to heel 3″; heel to end digit 2″ 4′′′.

Hab. ? Mus. Brit.

Of the preceding species of Anolis, sixteen have been derived from the British Museum collection. My particular acknowledgments are due to Drs. Gray and Günther, the directors, for the ample facilities afforded me in the examination of these and of other objects of interest under their care.

Laemanctus serratus.

Occipital prominence shorter and more elevated than in L. longipes, its border serrated with six prominent angular scales. Front with three pairs of large plates, the two posterior bounded exteriorly by two others. Seven superior labials to beneath orbit; infralabials smaller, lateral scales larger than in longipes. Scales everywhere keeled; dorsals a little smaller than abdominals. Collar not very distinct. Dorsal crest not elevated on the posterior half of the back.

A yellow band from loreal region to groin, brown bordered above from orbit to ear. A broader pale lateral band and six brown cross bars on the back.

This species is said to be found in the Orizaba Valley, Mexico. It is figured by Prof. Duméril in the Archives du Museé, 1856, pl. xxi. Specimens are also in the Museums of London and Leyden, the latter of which, through the liberality of Prof. Hermann Schlegel, have served as the types of my description.

The Laemancti fitzingeri, obtusirostris and undulatus of Wiegmann, belong to the genus Urostrophus, while the L. acutirostris is a true Polychrus. The type specimens of Wiegmann are preserved, under the direction of Prof. Peters, in the museum of the Friederich Wilhelm's University in Berlin. My thanks are due to the Professor for the many facilities which he kindly placed at my disposal, during investigations among these and his own numerous types.

Uta nigricauda,

Series of large dorsal scales narrow, embracing seven rows of uniform size; the scales smaller than the smooth abdominals, keeled, those posterior larger than those in the anterior part of each row. Laterals minute, flat; caudals largest of all, very strongly keeled; antebrachials and prefemorals larger than dorsals, keeled. Two dermal folds on each side, and a strong one in front of gular fold, beside a few cross folds in front of shoulder. Ear large, with three small fringe scales. Lateral occipitals small; frontal long, undivided, preceded by five large scales, of which the posterior pair is in contact on the median line. Five rather broad supraorbitals, separated from marginal row by minute scales. Infralabials five on each side, large, separated by one row of smaller scales from labials; the anterior pair in contact. Eleven and twelve femoral pores. End of muzzle to ear 5 lin.; ear to vent 1 in. 5½ l.; vent to end of tail 3 in. 2 l.; anterior limb 9 l.; posterior 1 in. 2 l.; hind foot 6½ l.

Brown above, sometimes very dark, with seven short lateral black cross-bands, sometimes light edged behind, on each side; never confluent across the median line. Tail black or blackish brown. Head above lighter, with a few superciliary brown specks or cross lines. Each side of abdomen blue from axilla to groin, deepest and nearly meeting other side on the median line. Throat in males orange.

Hab.—Cape St. Lucas, Lower California. From the Xantus collections, (No. 3723) Mus. Smithsonian, No. 5307. Mus. A. N. S. Phila.

This species is nearest U. graciosa, of the Colorado region, but has a shorter muzzle, broader front, and other distinguishing traits. It was found in considerable abundance with U. stansburiana and thalassina. U. bicarinata has been described by Prof. Duméril as typical of his genus *Phymatolepis;* it cannot be separated from Uta. His Sauromalus is also Euphryne of Baird.

Sceloporus utiformis.

Ten longitudinal rows of large, highly keeled, shortly mucronate dorsal scales, separated by many lateral series of minute flat scales, from the smaller entire edged abdominals. From axilla to ear the laterals are granular; a dermal fold extends to temporal from scapular region, and sends branches to a V-shaped fold, which extends downwards and backwards from the posterior border of the large auricular opening. Six (seven) rows of shortly highly keeled scales on nape; from which point to rump are about 26 transverse series. Gular scales entire; three moderate infralabials. Six rather short supraorbitals, separated from marginals by three rows of small scales. Interparietal as broad as long, subrectangular, with two parietals on each side. Frontoparietals not subdivided transversely, as is usual, but subdivided longitudinally to frontal; latter a little longer than broad; first row between canthi of three broad plates fully in contact. Profile arched, muzzle prominent, narrow. Thirteen femoral pores. Tail cylindrical, long. From end of muzzle to ear 7¼ l.; from ear to vent 2 in. 1 l.; vent to end of tail 5 in. 7 l.; anterior limb 1 in. 2 l.; posterior limb 2 in.; hind foot 11 l.

General color blackish, with numerous indistinct lighter cross bars. Below pale greenish grey; gular region greenish, with narrow light cross lines.

Hab.—Near Colima, Mexico. Obtained by John Xantus, U. S. Consul at Manzanillo.

A species technically nearest to the S. couchii, which exhibits much smaller dorsal scales, and approaching the genus Uta in its scutellation.

Sceloporus pyrocephalus.

Dorsal scales much larger than ventral, strongly keeled, unimucronate; in about twenty-five transverse oblique series from nape to crural region. Lateral scales larger than abdominal; of the latter a portion only slightly emarginate. Scales from ear to shoulder squamous; those of ear fringe a little larger than those anterior to them. Tail much compressed. Femoral pores twelve. Supraorbitals five, transverse, in immediate contact with narrow marginals, not touching superciliaries. Frontoparietal narrow; frontal broader than long, not divided. Parietals exceedingly small; interparietal large, much broader than long. Frontonasals two each side broader than long; posterior in contact; anterior embracing broad hexagonal internasal. Infralabials small, except the anterior pair, which is large and extensively in contact. From end of muzzle to ear 6 lines; ear to vent 1 inch 9 lines; length of anterior limb 11 lines; of hinder limb 1 inch 5 lines; of hinder foot 7 lines.

Greenish brown, with a broad black band from the scapular region to the groin, light bordered above. Below yellowish, sides bluish ash to near the median line, on each side of which is a series of from seven to nine transverse blue bars. Upper labial and gular region striped with a series of black or bluish lines, which converge posteriorly on a paler or deeper yellow ground. Top of the head bright chestnut red; the fontanelle white or pink, surrounded by a pale area. In many specimens, especially females, the head is brown above, except the parietal spot.

Hab.—Near Colima, Mexico; obtained by Jno. Xantus, U. S. Consul at Manzanillo, where it is abundant. Collection Nos. 1223, 1311. This small species may be known from the thayeri by the extension outward of its supraorbitals, and small size of its parietals, as well as by coloration, and its remarkably compressed tail.

Sceloporus oligoporus.

Dorsal scales large, mucronate, in twenty rows from interscapular to sacral regions, larger than laterals, which are larger than ventrals: last with a sharp mucro, and one or two emarginations. Tail cylindrical; femoral pores only two or three. Parietals large; interparietal longer than broad. Frontal and frontoparietal broad; former longer, undivided. Divided frontonasals and internasals in contact; supraorbitals in contact with both marginals and superciliary ridge, four on each side. Three pairs infralabials, transverse, the anterior barely in contact. Three bordering scales of ear, not larger than those preceding. End of muzzle to ear 11 lines; ear to vent 3 inches, 5 lines; length of tail 3 inches; length of anterior extremity 8 lines; posterior 2 inches 7 lines; hind foot 1 inch. Males, above brown, with a yellowish dorsolateral band and seven or eight pairs of yellowish, anteriorly black edged spots on the back. Top of head red; below whitish; sides faintly blue tinged. Females brown-olive, with a paler dorsolateral band. Throat, a broad band to shoulders, and sides of abdomen, blue.

Hab.—Near Colima, Mexico; from the Xantus coll.

A species to be compared with clarkii, zosteromus and spinosus, and differing from them and all other species in the fewness of the femoral pores, thus approaching the genus Proctotretus. The frontal is not narrow as in zosteromus, nor the ventrals rounded emarginate as in it and the other species. The supraorbitals are bordered by small scales in spinosus.

Sceloporus malachiticus.

Dorsal scales larger than lateral which are larger than ventral, strongly mucronate, in 25 to 28 rows from interscapular to sacral region, fourteen rows between axillæ and eight to ten between femora. Scales before shoulder squamous; marginal ear scales very small; supraorbitals five, broad, short, separated by small scales from superciliary ridge, and larger scales from narrow marginals. Parietals small, subtriangular; interparietal with parallel lateral borders, longer or as long as broad. Internasal broad; its anterior suture nearly straight. Infralabials small; anterior little or not in contact. Abdominal and gular scales not mucronate, and apparently not emarginate. Lateral scales, even to axilla, strongly mucronate, four times emarginate to serrate. End of muzzle to ear 8½ lines; ear to vent 2 inches 5 lines; anterior limb 1 inch, 5 lines; posterior limb 2 inches; tail ? ; sixteen femoral pores.

General color bright green, with angular dark cross-bars, five or six on each side. Sides of abdomen and throat blue; the latter extending to nape.

Habitat.—Costa Rica, near Arriba, whence the Smithsonian Institution has received specimens, 6492, through Chas. N. Riotte.

This animal is the tropical representative of our S. undulatus, though in general appearance not unlike the formosus. The much stronger mucronation and emargination of the scales, especially on the sides, as well as the color, are distinguishing traits.

Phrynosoma asio.

Nostrils lateral, in the line of the canthus rostralis. Three or four series of lateral gular scales on each side, which are short and subequal. Rostral present, flat semi-discoid. Eight scales on sharp infralabial ridge. Superior labials nine, subequal, not produced into horns continuous with temporo-occipital crest. Horns of latter, two diverging temporal, separated from two *vertical* occipital, which are separated by a depression. One high acute posterior superciliary on each side. Auricular opening large, bounded below and behind each by a bunch of spines. Two lateral series, superior large. Pectoral and abominal scales large, keeeled; femoral pores 7 to 9. A dorsolateral series of very thick spinous processes, and two median dorsal rows of flat mucronate scales, which become four rows of spines on the tail; one median nuchal row. Femur and tibia with two rows of spines each; three rows of very strongly keeled plates on the humerus. Tail of ♂ as long as from shoulder to vent; i. e., 3 inches 4 lines. End of muzzle to ear 1 inch; to shou'der 1 inch 6 lines; to end of temporal horn 1 inch 4 lines; to end of superciliary do. 1 inch. Width of front between middle of superciliary ridges 8 lines. Width of body (exclusive of lateral spines) 3 inches 4 lines.

General color ashy; the head pale; the body brownish: from occiput to groin between dorso-lateral and lateral rows of spines, deep brown, leaving a narrow pale space on nape. Four broad brown cross-bands anterior to sacral region, pale bordered posteriorly; nearly obsolete in ♂; tail with many brown, pale-edged cross-bands; below unspotted.

Habitat.—Colima, Mexico; from consul John Xantus.

This is the largest species of horned frog, and very distinct. Its affinities are between cornutum and coronatum.

Gerrhonotus gramineus.

Two pairs supranasals; the posterior longitudinal, elongate; internasal smaller than frontonasals. Four short supraorbitals; four marginals. Eleven supralabials. Two frenonasals, the smaller above the larger; one frenal and one very large freno-ocular. Six in first, five in second row of infralabials. Muzzle not produced; plates of head thickened and roughened, especially enlarged on the temporal region. Dorsal scales in twenty-three longitudinal series from nape to opposite groin, and in fourteen longitudinal rows; in form twice as long as wide, thick, with an obtuse keel, roughened in old specimens. Abdominal scales in twelve and fourteen series; lateral fold very weak. Extended limbs touching, or the posterior reaching wrist. Muzzle to ear 1 inch; to vent 4 inches 4 lines; vent to axilla 2 inches 11 lines; to end of tail 6 in. 3 lines; anterior limb 1 inch 2 lines; posterior 1 inch 7 lines.

Above bright pea green, each transverse series of scales blackish at the base, and yellowish at the tips. Below pale green, with a reddish tint in some, gular region and lower jaw yellow, abruptly separated from the green of the neck.

Habitat.—Orizaba, Mexico. Mus. Smithsonian. From a fine collection (No. 50), made by Prof. Sumichrast, which contained also Spilotes poecilonotus and Atropus undulatus. The Professor has recently published some interesting observations on the habits of certain Mexican reptiles in the Ann. Mag. N. Hist., 1864, p. 497.

Diploglossus steindachneri.

Tail cyclotetragonal. Scales in thirty-two longitudinal rows, (ten dorsal), without central keel, eight and ten striate. Limbs weak, not meeting when pressed to side by the length of the hind foot; digits much compressed, claws acute. Five supraorbitals; frontal longer than broad, subparallelogrammic. No frontonasals; internasal broader than frontal. Supranasals very large. Two frenonasals, one above the other; one very high prefrenal; two postfrenals, one above the other; one freno-orbitar. Nine supralabials. Interparietal triangular, longer than broad, separating the short parietals, whose posterior outline is emarginate and embraces the broader than long postparietals; frontoparietals very small. End of muzzle to shoulder 1 in. 1 l.; shoulder to vent 2 in. 6 l.; vent to end of tail 5 in. 2 l.; posterior limb 1 in. 2 l.

Olivaceous, the sides tessellated with small black spots, which become bands on the axillary and postauricular regions; lips greenish, black spotted; below uniform pale greenish.

Hab.—Orizaba, Mexico. Sent to the Mus. Smithsonian, (No. 6342), by Prof. F. Sumichrast. Dedicated to Dr. Franz Steindachner, of the Imperial Museum of Vienna.

Lampropholis assatus.

Scales small, entirely equal, in thirty longitudinal rows. Body subcylindrical; head short, not depressed. Tympanum large, in a deep depression, which is not fringed. Nasals and frontonasals respectively not in contact. Internasal little broader than long; frontal much produced anteriorly, very acuminate posteriorly. Single frontoparietal broad as long, with transverse posterior suture. Four rather large supraorbitals. Interparietal longer than broad; parietals narrow, in contact posteriorly, not succeeded by a double row of transverse scales. One high frenonasal, one frenal, two freno-orbitars, one above the other. Superior labials seven. Palatine maxillary laminæ overlapping their whole length. From end of muzzle to axilla 7½ lines; axilla to vent 1 in. 1 l. Length of tail 2 in. 5 l.; of hind limb 6½ lines.

Above brown fulvous; below pale fulvous; a faint dark line from eye across scapular region.

Hab.—Guatimala. Taken by Capt. J. M. Dow near the Volcano of Isalco, and presented by him to the Mus. Acad. Nat. Sciences.

The genus Lampropholis was first established by Dr. J. E. Gray, and called by him Mocoa. I prefer using the more classic and prior name of Fitzinger, though the genus is not to be attribnted to this author. The present species is the first which has been found on the American continent. The American species placed in it by Gray belong to the genus *Oligosoma* Grd., under which *Lygosomella* Grd., *Leptosoma* Fitz., and perhaps *Hombronia* Grd., may be placed as synonyms.

Oligosoma gemmingeri.

Scales in twenty-seven longitudinal rows; the two median nuchal scarcely larger. Body stout, cylindrical, limbs short, weak, the anterior reaching the anterior margin of ear anteriorly, posteriorly not touching extremity of appressed hind limb by its length. Seven upper labials; one frenonasal, frenal, and freno-orbitar each; parietals short; interparietal nearly broad as long. End of muzzle to axilla 10 lines; axilla to vent 1 in. 8 l.; posterior limb 8½ l.

Above fulvous or brown; beneath yellowish white. A dark dorso-lateral streak extends from the nostril to a distance on the tail, which is light bordered above on the body, and borders above a dark lateral shade.

Hab.—Orizaba, Mexico. From Prof. F. Sumichrast. Mus. Smithsonian, No. 6331.

This Mexican representative of our O. laterale differs in its stouter body and shorter limbs, its nearly equal dorsal and nuchal scales, its much shorter posterior cephalic and labial plates, and in color. Named in pleasant recollection of Dr. Max. Gemminger, of Munich, author of Fauna Boica and other works.

Paludicola pustulosa.

Muzzle compressed, narrow, plane above, produced beyond labial margin; canthus rostralis rounded. Nares nearly terminal; eyes rather large, each lid equaling the frontal width. Tympanum concealed; a large vocal sac. Skin above covered with small warts, some of which are linear and curved. No skin folds. Toes elongate, free, knobbed at extremities and under each joint; two metatarsal and one median inner tarsal spur; no tarsal fold. Below, on the breast, smooth, minutely rugose posteriorly. Two large metacarpal warts. Heel reaching middle of orbit. From end of muzzle to shoulder 7 l.; to vent 1 in. 3 l.; width across angle of jaws 5 l.; length of anterior limb 10 l.; of posterior 1 in. 9 l.; of hind foot 7 l.

Above blackish brown; elbow, tarsus and foot broadly banded with pink grey; below and on inner surfaces of limbs yellow, marbled with black, the latter color predominating anteriorly, but divided by a median yellow line to symphysis mandibuli.

Hab.—New Grenada, on the River Truando. Obtained by W. S. Wood, of Michler's Surveying Expedition. No. 4339.

Paludicola is a genus of Wagler's which has been latterly overlooked. It is the only one beside Schismaderma among the Bufonidæ which lacks the parotoids; from this genus it differs in its manubrium sterni, free toes, and tarsal spur, in this last respect resembling Gomphobates biligonigerus. It agrees with Bufo in the fully developed frontoparietal bones, differing from Epidalea (Bufo calamita Auct.) and Pseudophryne in this respect.

Phyllomedusa dacnicolor.

Parotoids exceedingly weak, if present. Fingers very slightly, toes one-third webbed. Labial margin projecting, profile sloping. Tympanum one-half orbit. Eyes not very prominent, transparent, inferior palpebra reticulated with white veins. Mandibular outlines straight. Tongue long, pyriform, openly emarginate posteriorly. Skin above smooth; inferior areolations not extending on pectoral or gular regions. Vomerine teeth in two straight transverse rows between anterior margin of inner nares. A few small pustules on anterior part of sides, which are yellow, like the inferior surfaces. Superior surfaces (narrowly on femur,) violet blue. Upper lip not light bordered; gular region and posterior faces of femora immaculate. From end of muzzle to posterior border of tympanum 10 lines; from angle to angle of mandible 1 in. 1 l.; end of muzzle to vent 3 in. 6 l.; anterior extremity 2 in.; posterior limb 3 in. 10 l.

Hab.—Near Colima; from the large Xantusian Coll.

This species diverges widely from the type of Phyllomedusa in its webbed toes and almost absent glands, but the glands are only a little stronger in the P. azurea. It affords an easy passage to the true Hylæ, whose family it enters, by the genus Agalychnis Cope. The type of the latter is Hyla callidryas Cope, and H. moreletii and holochlora are the other species. They have the tongue long and extensively free, sometimes emarginate, and the transparent inferior palpebra reticulated with strong white veins. The inner toes are remarkably lengthened and free of movement.

On the Limits and Relations of the RANIFORMES.

BY E. D. COPE.

Similar relations to those which exist between the mammalia Implacentialia and the remainder of the class, and vice-versa, are apparently repeated in other groups of greater or less rank in the animal kingdom. Among the tortoises, the Pleurodera separate themselves most strongly by the union of their ischia with the plastron, the *absence of the arch of the o. prefrontale* which elsewhere descends to the o. palatinum, or vomer, and their intergular shield; while they present modifications among themselves characteristic of most of the other families, arranging themselves according to the development of the parieto-mastoid arch, in an ascending series, which terminates in Bothremys and Podocnemys, where the temporal fossa is entirely roofed in, as in the sea turtles. In the Lacertilia Acrodonta we have a group equally removed from others of the order. The acrodont dentition, the great development of the o. dentale and final extinction of the o. operculare, etc., and the exclusion of the premaxillare from contact with the vomer, are peculiarities not found associated in other lizards, while their parallel representation of the groups of the Iguanidæ at least, among the Pleurodonta, is well known. In general these also form an ascending series to be measured by the gradual extinction of the o. premaxillare* and o. columellum, which finally occurs in Chamæleo.

The Raniformes among Batrachia Salientia are in many respects comparable to the Acrodonta. They stand at the head of their order, possessing the most compact, powerful and complete organization, and in spite of the constant imitation of the many lower types, their is a certain homogeneity in important points. The structure of the sternum separates them at once, and presents less variety than in the other suborders. The o. o. coracoïdea are distally much dilated horizontally, especially anteriorly, and in close contact on the median line; their axis is transverse. The o. o. epicoracoïdea are also transverse, and usually in contact medially, always resting against the anterior angles of the coracoïdea. The manubrial and xiphisternal pieces are dilated proximally and become cylindrical or styloid, terminating in a cartilaginous disc. The only other cartilages of the sternum are the intersutural. Frogs with this sternum always have a cylindrical diapaphyses of the sacrum, and never a fronto-parietal fontanelle. In the ordinary type of sternum the coracoïdea are little or not dilated, and converge posteriorly without meeting, while the epicoracoïdea converge anteriorly and are connected with the former by longitudinal arched cartilages; hence I have termed these Arciferi. Among the toothless Batrachia or Bufoniformes (which have dilated sacral diapophyses, except in one genus), some forms show an approach to the Raniform style, while in the Aglossa we find the most exaggerated Arciferous type.

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* This bone, said to be single in Lacertilia, is divided in all the *true* Scincidæ, in Phyllurus among the Geccotidæ, and, according to Owen, in Hatteria.

The Raniformes embrace but one family, but this imitates well many genera of Arciferi. The metropolis of the former, as of the Acrodonta, is the Regio Palaeotropica, while the latter have but few representatives out of the R. R. Neotropica and Australis, where but one or two species of the former occur. In both we can trace a series in which the outer metatarsal is gradually liberated from the penultimate, to afford greater extension for the web in the most aquatic types, and among those where these bones are bound, from webless to webbed types. In both we have burrowing and arboreal genera.

In strict reference to the extension of the webs the following parallels may be drawn:

	Raniformes.	*Arciferi.*
External metatarsal free.		
Aquatic.	Rana.	Pseudis.
Subfossorial.	Hoplobatrachus.	Myxophyes.
External metatarsal attached.		
	Feet webbed.	
Burrowing.	Pyxicephalus.	Tomopterna.
Arboreal.	Leptopelis.	Hyla.
"	Hyperolius.	Hylella.
Subarboreal.	Hylambates.	Nototrema.
	Feet not webbed.	
Terrestrial.	Cassina.	Cystignathus.
" spurred	Hemimantis.	Gomphobates.

Comparing the genera in a general physiological sense, we may parallelize further—

Aquatic, with digital dilatations,—	Heteroglossa.	Acris.
Arboreal.	Polypedates.	Trachycephalus. Hyla.
"	Rhacophorus.	Agalychnis.

It is, however, remarkable that the Raniform tree-frogs nearly always have the external metatarsal bone free, the Arciferous always bound; the terminal phalanges of the latter are constructed on a ball and claw type, in the former they are T-shaped or bifurcate, except in the single West African genus Leptopelis, where the South American type is repeated.

Evidently belonging to former times, as their present weak representation and generalized structure seem to indicate, are two families of Arciferi not at all imitated among the Raniformia. These are the Discoglossidæ and Asterophrydidæ. In both the vertebræ are opisthocoelian instead of procoelian, and the sacral diapaphyses are dilated. The latter approaches closest to the ordinary type, having a simple coccyx with but one condyle, no ribs or fronto-parietal fontanelle, and a styloid xiphisternum. The genera are Megalophrys, Xenophrys, Asterophrys, Leptobrachium and Cryptotis, one Indian, one Australian, the rest Malaysian. The former family is the most remarkable. It has rudimentary ribs, a xiphisternum divided into two long haemapophyses, a coccyx with diapophyses and two condyles, and, in the recent types, a fronto-parietal fontanelle. The genera are Latonia, Discoglossus, Alytes, and Bombinator, all European. There are no arboreal types in these two families, and their terminal phalanges are straight, conic. They form the nearest living approach to the Batrachia Gradientia.

The Batrachian which have been called Proteroglossa form, I believe, a family—Rhinophrynidæ—among the Bufoniformes.

Description of a GAR-PIKE, supposed to be new—Lepidosteus (Cylindrosteus) oculatus.

BY PROFESSOR ALEXANDER WINCHELL.

In the month of February, 1863, the Museum of the University of Michigan received a specimen of an unknown gar-pike, from Duck Lake, Calhoun Co., Michigan. As Prof. Agassiz had made a special study of this genus, and had declared that he was acquainted with twenty-two species, I transmitted to him a brief description of the fish; but, for some reason, I received no reply. I sent the same to Prof. Baird, but obtained no assistance; I then wrote Mr. Putnam, at Cambridge, for references to all the published descriptions of *Lepidostei*, and, a few months ago, received the information sought; though most of it was already within my reach. On Prof. Agassiz' visit to Ann Arbor, last winter, during my absence this fish was shown to him by Dr. Sager. Prof. Agassiz thought it had been described by Dr. Kirtland, but he could not say in what work the description had appeared. The impression given was, that it had been published in some agricultural work, in Ohio, not generally accessible, and not likely to be seen by ichthyologists. I wrote to Dr. Kirtland on this point but received no reply. I am convinced that this species, if ever described, has not been made known through such a medium that the description can be said to be *published* to the scientific world. I am, therefore, determined to run the slight risk of creating another synonym, by offering the following name and detailed description.

LEPIDOSTEUS (CYLINDROSTEUS) OCULATUS. Winchell.

General form elongate-spindle-shaped, laterally flattened toward the tail, and vertically flattened from the nape forwards. Greatest height contained 10½ times in the whole length; greatest width the same. Lower outline nearly straight, slightly ascending at the throat, and more so from a point anterior to the anal to the base of the caudal fin; upper outline gently curved along the back, anteriorly somewhat more rapidly curved to a point over the angle of the mouth; lateral outline gently and equally curved from the extremity of the snout to the base of the tail; greatest vertical diameter through a point about three scales in front of the abdominal fins; greatest transverse diameter through a point about six scales in front of the abdominals.

Number of scales in a diagonal series (between the dorsal and ventral rows) 18, occasionally increased to 19, by the interpolation of an additional scale near the ventral row; number of scales in the dorsal row, between the head and the dorsal fin, 48; behind the dorsal fin, 8 or 9. The first diagonal series of scales do not meet on the nape of the neck, being separated by the pair of mutually equivalent scales of the dorsal row, which belong in the second diagonal series; these two scales are pentangular. The scales of the dorsal row increase in width from the third to the sixth; the third is small, triangular; the fourth, rounded posteriorly and slightly curved on the four other sides; the fifth becomes emarginate posteriorly, convex on the two contiguous sides, and overlapped antero-laterally by the adjoining scales of the next anterior diagonal series; the sixth exhibits the same form with a greater transverse diameter; the seventh is small again, and the width gradually increases to the tenth; the eleventh in turn is small, and the size increases to the sixteenth, beyond which the size is rather variable. From the sixth to the twenty-second, the general form of the sixth is preserved, with a tendency to become less and less emarginate, and more elongate longitudinally. The lateral scales are rhomboidal, those which lie along the lateral line having the dimension which coincides with the direction of the diagonal series one and one-third times the other dimension. The longer sides are nearly straight; the shorter, sigmoidally curved by lines which first bend downwards and then upwards. This form of the scales is shown to some extent by nine or more lateral rows on each side. Generally, the scales nearer the head are less angulated behind; while those toward the other extremity are more drawn out. The surfaces of the scales, where not worn, are rough to the touch; and under a magnifier, and even to the naked eye, are seen to be covered with fine granules. The first diagonal series is sculptured by vermicular, intersecting furrows, which show a tendency to radiate from the central area. Similar sculpturing can be traced on the sides, as far back as the sixth series.

Head one fourth the total length of the fish, lanceolate in outline, laterally tapering, with slight curvature from the hinder border of the opercula to the extremity of the truncately rounded snout. Eyes large, situated less than the diameter of the orbit behind the extremity of the lower jaw. Projection of the upper jaw beyond the lower, equal to the distance between the nostrils, which, opening upwards, in oval apertures, are situated half the same distance behind the tip of the snout. Lower jaw a little more than half the whole length of the head. Angle of the mouth midway between the tip of the snout and the hinder margin of the operculum. Each ramus of the jaw presenting below a flat surface, with parallel borders extending directly back for a short distance, and then slightly arching outwards; on its lateral surface regularly increasing in vertical width to the small "angular piece;" through half its whole length projecting laterally beyond the maxillary; furnished with a principal row of strong conical teeth slightly bent backwards and inwards; the lips furnished with a smaller set, and the internal surface clothed with a multitude of dentelets. The principal and labial teeth of the maxillary and intermaxillary are similar to those of the lower jaw; the palatines are set with numerous fine teeth. The top of the head is somewhat flattened, becoming decidedly so on the snout. The suture bounding externally the frontal and parietal bones is a distinct, deep furrow, gently deflected outward at the base of the maxillary, behind which is a deep supra-orbital emargination of the frontal, which thence continues to widen regularly to its junction with the parietal. Opercular semicircular behind, nearly straight in front; interopercular lanceolate, widening backwards, somewhat pointed in front, abruptly round-cuneate behind, with a triangular projection between the opercular and preopercular. Occiput regularly concave behind, except a backward swell in the middle. Whole surface of the head handsomely sculptured, the vertex rather deeply so; on the snout and the sides and base of the head the embossed lines tend to become broken into granules.

Pectoral fins separated from the operculum by a single diagonal series of scales; the ventral fins midway between the extremities, situated on the diagonal series which embraces the 17th scale in the dorsal row; anal fin a little more than its width from the caudal, interrupting the 38th—42d diagonal series of scales; dorsal fin of the same width as the anal, and situated so that the last three rays fall in the rear of it; pectoral fins narrow, sharply rounded at the extremity, with the middle ray the longest; ventral fins relatively broader, rounded, with the second and third rays the longest, the last ray being the width of the fin shorter than the first; anal fin a little shorter than the ventral, but twice as broad, rounded, with the 3d and 4th rays the longest; caudal fin symmetrically and elliptically rounded at the extremity; the first (upper) ray reaching a little further back than the last; the first three rays considerably smaller than the last three, so that the sixth ray falls in the middle; skin terminating in a line stretching sigmoidally backwards from below to above, so that the base of the last ray is two-thirds the width of the tail anterior to the base of the first ray. A series of scales diminishing in size continues along the first and last rays of the caudal, and the first ray of all the other fins.

Ray formula: D. 8; C. 11; A. 8; V. 6; P. 9.

The ground color is pale yellowish-white, becoming deeper on the sides and back, and nearly white below. This is varied by a system of pale black maculation, which, along the back, conceals most of the ground color, and on the sides, about half of it, while the belly is almost spotless. On most parts of the body the maculæ are irregular, with a tendency on the sides to elongation beyond the length of one or two scales. On the top of the head and the operculum they become sharply defined circular spots, with intermediate blackish dots, while the throat is spotted in the style of the breast of a partridge. The fins are all maculate with oval, badly defined spots.

Measurements.—Total length 32·5 inches. Length of head from snout to occiput 6·8; to posterior margin of operculum 7·7; length of tail on the middle line 4; upper jaw to angle of mouth 4; width of snout one-fourth inch back from nostrils 0·62; width at angle of mouth 1·5; width of neck between posterior margins of opercula 2·2; greatest height of body 3; greatest width 3; height of head at occiput 2; at angle of mouth 0·8; length from tip of muzzle to insertion of pectoral 6·7; to insertion of ventral 9; to insertion of anal 17; diameter of orbit 0·57.

Comparisons.—In form, this species approximates most nearly to *Cylindrosteus latirostris*, Girard, from Texas. It differs specifically in having a larger orbit, the operculum and cheek less elongated behind it, the muzzle tapering a little more rapidly, and two or three fewer scales in an oblique series. The color, besides, is much less uniform, and the habitat remote. From *C. platostomus*, Rafinesque, it differs in having the caudal fin more nearly symmetrical; rays of ventral fin *not* cartilaginous; pectoral longer, narrower and straighter. The caudal has one more ray, and the anal and pectoral each one less. The snout widens less rapidly, and the scales are more rhombic. The coloration, especially the sharply defined circular spots, is strikingly peculiar. No spots, however, exist on the median line behind the anal fin. There are no other described species with which the present one requires to be compared, unless it be *C. albus* and *C. longirostris* of Rafinesque, and *L. gracilis*, Agassiz. The two former are very doubtful species, and the description of the latter is not at present accessible to me..

The following is now a list of the described species of Lepidosteidæ, arranged under three genera, discriminated according to information at hand. No attempt is made, at present, to exhibit the complicated synonymy, as the result would necessarily be too imperfect, from the want of adequate means of comparison.

Lepidosteus Huronensis, *Richardson.*
" gracilis, *Agassiz.*
" oxyurus, (*Rafinesque,*) *Kirtland.*
" spatula, *Lacépède.*
" osseus, *Lacépède.*
" leptorhynchus, *Girard.*
Cylindrosteus oculatus, *Winchell.*

? Cylindrosteus longirostris, *Rafinesque.*
? " albus, *Rafinesque.*
" platystomus, *Raf.*
" latirostris, *Girard.*
Atractosteus ferox, *Rafinesque.*
" Berlandieri, *Girard.*
" tristœchus, *Gill.*
" tropicus, *Gill.*

September 6th.

MR. CASSIN in the Chair.

Twelve members present.

The following papers were presented for publication:

"Synopsis of the Pleuronectoids of the eastern coast of North America." "Synopsis of the Cyclopteroids of eastern North America." "Note on the Paralepidoids and Microstomatoids, etc." And "Synopsis of the Pleuronectoids of California, &c." By Theo. Gill.

"Description of new Genera and Species of North American Myriopoda." By Dr. H. C. Wood, Jr.

September 13th.

DR. HAYS in the Chair.

Thirteen members present.

September 20th.

Vice-President BRIDGES in the Chair.

Twenty members present.

The following papers were presented for publication:

"Descriptions of new Genera and species of Pleuronectoids." "On the affinities of several doubtful British Fishes;" and "Notes on the Family of Stichæoids." By Theo. Gill.

"Notes on Shells, with Descriptions of new fossil Genera and Species." By T. A. Conrad.

September 27th.

Vice-President BRIDGES in the Chair.

Twelve members present.

On report of the respective Committees, the following papers were ordered to be published:

Description of New Genera and Species of North American MYRIAPODA.

BY DR. H. C. WOOD, JR.

Family *POLYZONIDÆ.*

Genus OCTOGLENA,* Wood.

Oculi octo, in seriebus duobus simplicibus dispositi.

The eyes in this genus are very prominent, and are arranged in two straight rows, which are so placed, one on each side, near the base of the antennæ as to be convergent inferiorly.

O. BIVIRGATA.

O. brunneus, utrinque virga fusca ornatus; segmentis fere 45.

The head of this species is very small, and is pilose. The antennæ are rather heavy, and are very pilose. The eyes are large and very prominent. The dorsum is slightly convex, and is ornamented on each side by a broad fuscous stripe, which is intersected by numerous, indistinct, dark lines.

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* γληνη oculus.

The scuta are very smooth, and have no distinct lateral plates, but their edges are rather thin and strongly elevated. The penultimate scutum is much broader than its neighbors. The last scutum is very small. The feet are dark colored. There are two or three specimens in the possession of the Academy, which, I believe, were collected by Dr. John L. Le Conte, U. S. A., in the mountains of Georgia.

Family *SIPHONOPHORIDÆ.*

Genus BRACHYCYBE.

Rostrum acutum, brevissimum, antennis multo breviore.

I have never studied the allied genus *Siphonophora* of Brandt, but, if the characters relied on by that author are at all generic, there can be no doubt that the American species belongs to a distinct genus. In the *Siphonophora* the rostrum or mouth is very much elongated, and approaches the antennæ in length. In *Brachycybe* the latter are several times the longer.

B. LECONTII, Wood.

Fulvo-brunneus? dorso modice convexo, medio leviter canaliculato; antennis parvis, filiformibus, pilosis; scutorum superficie asperata, obscure transverse canaliculata; scuto postremo postice spinæ obtusæ serie instructo; laminis lateralibus longis, angustis, vix sejunctis; segmentis 47; pedibus breve pilosis.

In our specimens, which have been preserved for a long time in alcohol, the color is a light yellowish-brown. The anterior scuta are tuberculate, the posterior merely roughened. Each has a more or less obsolete transverse groove extending along the lateral lamina. The latter are very long and narrow; they are placed very close together, and are often bent slightly backwards. Their external margin is somewhat oblique, and is furnished in all except, perhaps, the most anterior, with a pore. The small feet are entirely concealed beneath the broad body. The male genital appendages consist of two pairs of acute feet-like processes. It affords me much pleasure to dedicate this species to Surgeon John L. Le Conte, U. S. A., as an acknowledgement of the many assistances which he has afforded me in the prosecution of my studies.

Hab.—Georgia. Coll. of the Acad. Mus. Comp. Zoology. Dr. John L. Le Conte, U. S. A.

Note on the PARALEPIDOIDS and MICROSTOMATOIDS, and on some Peculiarities of Arctic Ichthyology.

BY THEODORE GILL.

My attention having been attracted to the resemblance between the Alepidosauroids and Paralepidoids, shortly after my article on new species of the former family, I embraced the opportunity, when in Philadelphia, to examine the specimens of the two genera, *Paralepis* and *Sudis*, in the Bonaparte collection, secured by the liberality of Dr. Wilson. The suspicions of the close affinity of the two families were fully confirmed, and the same logic that would prove the Alepidosauroids to be Siluroids, would cover the Paralepidoids. Nearly equally erroneous would be the reference of those families to the Scombroid group, near which I formerly retained it with Lowe. The Paralepidoids are, indeed, chiefly distinguished from the Alepidosauroids by the small dorsal fin, and the more posterior ventrals, and wherever one is placed, the other must be approximated next to it.

The species of this family of Paralepidoids are divisible among three groups, whose relations and differential characters are expressed in the following table :—

I. Head acutely conic ; snout pointed, and oral cleft nearly rectilinear. Teeth of lower jaw part enlarged, slender and pointed, part small and slender.......... **PARALEPIS.**
  α. Dorsal fin decidedly in front of ventrals.......... **Arctozenus.**
  β. Dorsal fins opposed to ventrals.......... **Paralepis.**
II. Head blunt, and oral cleft curved upwards towards the end. Teeth of lower jaw partially erect, compressed, dagger-shaped, partially directed forwards.......... SUDIS.

The distribution of these three groups is most remarkable. *Paralepis* and *Sudis* are types as yet only known to be represented in the Mediterranean Sea, while *Arctozenus* is represented by a single species, hitherto only found in the waters of Greenland, and yet there is the closest affinity between *Paralepis* and the Arctic type, so close, indeed, that only since the opportunity afforded to examine the detailed figures of Kroyer, have we been able to fully appreciate their distinctive characters. In order to assist less fortunate naturalists, the following diagnosis of the newly named subgenus is given.

ARCTOZENUS, Gill.

Head elongated conical, *attenuated* towards the snout, with the snout *quasi*-pointed, the jaws straight, the lower behind mostly covered by the upper, and little exposed along the sides ; the teeth of the lower jaw, along the anterior half, enlarged, but slender, recurved and distant ; along the posterior half, minute, acute and approximated ; the dorsal fin behind the middle, but considerably in front of the ventrals.

Type.—Paralepis borealis, *Reinh.* Arctozenus rissoi kroyeri

In the family of Microstomatoids,* which is related to the Paralepidoids, we find the same peculiarity in geographical distribution ; the genus *Microstoma*† being confined to the Mediterranean, while in the Greenland seas a closely related representative is found.

Still another case of similar, or rather even more remarkable character, is exhibited by the Stomiadoids. This family, distinguished by the combination of an enormous mouth, and the opposition of the dorsal and anal fins, is composed of two genera, *Stomias* and *Malacosteus*. The former is represented by apparently *closely related* species, respectively inhabiting the Mediterranean and Greenland Seas, while of *Malacosteus*, a single species discovered south of the Newfoundland Bank has been described. As, on account of the misconceptions of the author of the last named genus, it has been involved in considerable mystery, a diagnosis of it, with reference to its ally, may be useful ; but I desire expressly to add, that I do not hold myself responsible for any of the facts, not having seen the original specimen, and that the statement of the absence of scales, &c., requires to be confirmed, although it is quite probable that none exist. The original describer has denied to the genus branchiostegal rays !

MALACOSTEUS, Ayres.

Proc. Boston Nat. Hist. Soc. Boston Journ. N. H. vi., 53—64.

Body elongated claviform, constricted only at the caudal peduncle ; without scales ; with the head very convex, and protuberant in front of the eyes ; the opercular and tympanic regions very oblique, the opercular bones reduced, the oral cleft rectilinear; *teeth* of the upper jaw minute; of the lower, in front, enlarged, but unequal, elongated, recurved and acute; behind minute; at the symphisis directed forwards; small, acute and hooked, and in a double row on the tongue; palate smooth; caudal very small, convex; pectorals inserted very low, linear, of few rays closely connected; ventrals scarcely behind the middle, with about six rays, the external (except the outermost) of which are produced. Intestine with a flexure.

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* Although the adipose fin has been denied to *Microstoma* by such skilful observers as Muller and Valenciennes, I think that I am able to distinguish it in specimens of the *M. rotundatum*, preserved in the collection of the Academy.

† Microstoma, *Cuv.*, R. A. 1817, ii., 184 : Risso, 1829, ii. ; *Cuv. et Val.* xviii., 358. Reinhardt appears to have first introduced the modification *Microstomus*.

Type.—Malacosteus niger, *Ayres.*

"The principal points on which" Mr. Ayres would "particularly insist, as characteristic of the species and the genus, are the remarkable small size of the head, and, in contrast with this, the immense developement of the whole facial and branchial apparatus, and all that pertains to the mouth and throat, the singular and but partially explained organ on the cheek; and, most of all, the embryonic condition of the entire osseous system." In all respects—perhaps even the last—the genus resembles *Stomias.* Sir John Richardson has suggested that the want of ossification may be due to the preservation of the fish in weak alcohol, but I am scarcely disposed to accept that hypothesis, and would even believe that *Stomias* itself may be found to have an imperfectly ossified skeleton, but not, perhaps, in so marked degree as *Malacosteus.*

In the consideration of the faunistic anomalies here enumerated, we may be aided in a solution of the causes by the consideration of nearly similar peculiarities in the Ichthyology of the Scandinavian seas. There alone in the more northern seas, species of the genera *Beryx* and *Batrachus*, closely allied to or undistinguishable from Mediterranean or tropical species, are found, and there also has been discovered *Pterycombus*, a genus whose affinities are with the tropical *Pteraclides.* No representatives are found at intermediate places along the European coasts. Again, along the Rhode Island and neighboring coasts have already been found *Sarothrodus*, *Priacanthus*, and *Hyporthodus*, the last closely related to *Serranus.* All the places enumerated are near the borders of the Gulf Stream. How far the distribution of these genera is thereby affected it is not my intention to now discuss, my desire being simply to draw attention to the facts. Further details regarding their *bathymetrical*, as well as geographical, distribution are desirable.

Synopsis of the CYCLOPTEROIDS of Eastern North America.

BY THEODORE GILL.

The description of a new species of *Liparis*, from the Arctic seas, is here submitted, and attention is called to some points in the synonymy of other species of the genus which require elucidation. To complete a view of the family to which they belong, I enumerate the Cyclopterinæ. The family is restricted, with Günther, to those fishes whose suctorial disk is formed by the union of the ventral fins, and which have numerous pyloric cæca, as it is not evident that there is any close relation between such and the *Gobiesocoids.*

CYCLOPTERINÆ, Bon.

Cyclopteroids with a ventricose body and two dorsal fins, the first of which is small, and composed of spines; the second, as well as anal, short, and obliquely opposed to each other; and with the caudal vertebræ in scarcely increased number, (Vert. 12+16 pm.)

Genus CYCLOPTERUS, L.

Lumpus, *Cuv.*

Cyclopterinæ with dorsal region elevated in front, larger plates disposed in an unpaired dorsal row and two lateral and one abdominal on each side; the eyes small and anterior; the branchial apertures just above the pectoral fins; the spinous dorsal almost concealed, and the ventral disk small.

CYCLOPTERUS LUMPUS, L.

Cyclopterus minutus, *Pall.* (Young).
Cyclopterus cæruleus, *Mitch.* (New York).
Lumpus vulgaris, *Storer.*
Lumpus anglorum, *Dekay.*

Hab.—Greenland to New York.

Is the American *Cyclopterus* identical with the European? The latter has not been examined by myself.

Genus EUMICROTREMUS, Gill.

CYCLOPTERINÆ with the back gibbous; the large plates less regularly disposed, and obsolete on abdomen; the eyes large and submedian; the branchial apertures elevated, and behind the ocular region; the spinous dorsal well developed, provided with 6 or 7 spines; and the ventral disk large.

EUMICROTREMUS SPINOSUS, Gill.

Cyclopterus spinosus, *Fab.* et al.

Hab.—Greenland.

Subfamily LIPARIDINÆ.

Liparinæ *Gill* Cat.
Liparidina *Gthr.* Cat. iii.

Cyclopteroids with an elongated body, and long, uninterrupted dorsal and anal fins, the anterior rays of which, especially of the dorsal, are spinous, and with caudal vertebræ in greatly increased number, (Vert. 10—12+25—50.

Genus LIPARIS, (Art.) Linn.

Cyclogaster *Gron.*

LIPARIDINÆ with a nearly or quite horizontal oral cleft; longer upper jaw; pluriserial tricuspid teeth; a well developed ventral disk on the breast, below or partially behind the posterior half of the head; the anus little in advance of the anterior third of the length, and the origin of the anal fin not far behind it.

Type.—Cyclopterus liparis *L.*

This genus, even after the elimination of the *L. tunicata* of Kroyer, exhibits considerable variation, especially in the relations of the dorsal and anal fins to the caudal, these fins being, in some species, completely isolated, while in others they are coalescent, and united in an almost anguilliform posterior fin. In the latter, the nostrils also appear to be simple, while in the former the posterior ones are tubular. These differences appear still further to be coincident with a disparity in the number of caudal vertebræ, and of the rays of the vertical fins. Nevertheless, it is not deemed advisable to generically separate the types so distinguished.

But the differences between the *Liparis tunicata* of *Kroyer*, (Tidskrift, ser. 3, B. i., 236), and the typical *Liparides*, appear to indicate a more decided demarcation, and the morphorological differences mentioned in the analytical table are apparently coincident with difference in size; it is, therefore, probable that the species is the type of a distinct genus, for which the name of *Actinochir* would be appropriate. For the present, however, it is retained in the genus *Liparis.*

The increase of our knowledge of the Greenland Liparidinæ, since the publication of the "Catalogue of the Fishes of the Eastern Coast," is chiefly due to Dr. Kroyer, who, appreciating the imperfection of our information, has favored us with a monograph of those species. This has chiefly served as the basis of the present article.

I omit, for the present, references to the *Liparides* of the British northern travellers.

Synopsis.

I. P. 28—35. Anterior nostrils simple. D. 12—15+ A. 2. 24—33.
* D. and A. connate with C. Posterior nostrils tubular or subtubular.
D. 13+21.* A. 2+29. C. 13. P. 34. Coloration in longitudinal lines..... .... lineata.
D. 12+30. A. 2+32. C. 11. P. 35. Color uniform reddish-brown.. arctica.
D. 13+27. A. 2+30. C. 9. P. 34. Color dirty yellow, with darker blotches. (Nostrils scarcely tubular)…. .... Fabricii.
** D. and A. disconnected with C. Posterior nostrils simple.
D. 13+16—17. A. 24—25.† C. 18. P. 29—30.................. Montagui.
II. P. 42 pm. *Anterior* nostrils tubular; (posterior, simple). D. 21 +24. A. 7+31. C. 10 pm. D. and A. connate with C. near base. major.

LIPARIS LINEATA, Kroyer.

Liparis lineata, *Kroyer*, Naturhistorisk Tidskrift, ser. 2, b. ii., p. 284. 1847.
" " *Kroyer*, Voyage en Scandinavie, &c., tab. 13, fig. 2, a—g.
" " *Lütken*, Videnskabelige Middelelser frà den Naturhistoriske Forening i Kjöbenhavn, 1860, pp. 169—174.
" " *Kroyer*, Naturhistorisk Tidskrift, ser. 3, B. i., pp. 244—251.
" " *Lütken*, op. cit., 1861, pp. 243—265, pl. 7, fig. 1.
" " *Kroyer*, op. cit., ser. 3, B. i., pp. 539—553.

In the synonymy of *Liparis lineata*, I have only included the references to the Greenland fish, without, by any means, undertaking to decide between Drs. Kroyer and Lütken, the former of whom considers the Greenland fish entirely distinct from the *Cyclopterus lineatus* of Lepechin, while the latter considers it the same, and also identical with the *Liparis vulgaris* of Europe, but still retains the name *Liparis lineata*, as Lepechin first gave the distinctive appellation. As, therefore, the nomenclature is not affected, Dr. Kroyer retaining the name *Liparis lineata* for the Greenland fish, I am glad to be able to leave the controversy in *statu quo*.

The discrepancies between the radial formula, especially of the caudal fin, of *Liparis vulgaris* of authors and *Liparis lineata* deserves attention. Thus Günther assigns to his *Liparis vulgaris* D. 35—36, A. 27—28, C. 10; Lepechin, to his *Cyclopterus lineatus*, D. 36, P. 26, A. 28, C. 13?; Kroyer, to his *Liparis lineatus*, D. 13+21, A. 2+29, C. 13, P. 34; and Lütken, to his, D. 36, A. 30, C. 14? P. 33, and with the results of the latter two my own observations agree.

Of thirteen English specimens of the so-called *Liparis vulgaris* of Yarrell, eleven exhibited little distinct coloration on the body, but the dorsal and anal fins were densely dotted, so as to give to those fins, especially when folded, a blackish-blue hue. The pectorals of some, especially towards the superior margin, were also clouded. In one specimen, the head and body were distinctly marmorated, and delineations like those represented on the head, body and pectorals of *Liparis lineatus* by Kroyer, and *L. lineata* by Lütken, were observed, but the dorsal and anal were simply dotted as in the ordinary variety, and the delineations themselves were dark lilac on a yellowish ground. The last one, consequently, represented the *L. lineatus* of Lepechin and Lütken, and the others the *L. barbatus* of Ekstrom and Lütken.

LIPARIS ARCTICA, Gill.

The greatest height exceeds a third of the total length, while the greatest width is rather less than a seventh; the height at the end of the caudal peduncle equals about a fourth of the length of the caudal fin. The *head*, from the snout to the margin of the auriform projection, almost or quite equals a fourth of the length, while its breadth enters nearly 6⅓ times in the same, and is little greater than the height; the forehead is depressed, and the snout moderately high and decurved. The *eyes* are just within the anterior half of the head; the width of the forehead between them equals a third of the head's length. The anterior nostrils are simple; the posterior tubular. The dorsal and anal are connate with the caudal; the former united for about a fourth of the length of the caudal, the latter two-fifths. The caudal is convex behind, and forms a seventh of the length. The pectoral enters about 5⅓ times in the length, and the ventral disk ten times.

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* The formula D. 19+21 appears to have been given through inadvertence, in the Tidskrift, ser. 3, i., 244.

† A. 2. 24, *Kroyer*, Nat. Tid. ser. 3, i., 548; A. 4. 20—2. *Kroyer*, ib i., 273.

D. XII. 30. A. II. 32. C. 11. P. 27+8.

The color is uniform reddish-brown or dark chesnut, without spots or bands.

This species, in general form as well as color, resembles the *L. Montagui*, but is in other respects widely different. Its relations to the other Greenland species is exhibited in the analytical synopsis; it is well distinguished by its rusty color.

Specimens were obtained by the Arctic navigator, Dr. Hayes, at Port Foulke, Greenland, and are preserved in the Academy of Natural Sciences of Philadelphia, and the Smithsonian Institution. In the Museum of the latter, there is only a single specimen.

LIPARIS FABRICII.

Doubtful Synonymy.

Cyclopterus liparis, altera minor, *Abopokitsok*, *Fab.*, Fauna Grœnlandica, p. 135, 1780.

Cyclopterus liparis, minor *Walbaum* in Artedi, Genera Piscium, p. 489, 1792.

Cyclopterus liparis, *a Bonnaterre*, Tableau Encyclopedique et Melthodique.—*Ichthyologie*, p. 28, 1788.

Liparis tunicata, pp. *Reinhardt*, Oversigt orer det kongelige Danske Videnskabernes Selskabs Forbandlinger vi., p. cxi., (*tr.* Archiv für Naturgeschichte, Jarhg. iii., B. i., p. 267, 1836).

Vix Liparis tunicatus *Reinhardt*, op. cit., p. 78. (Isis von Oken, 1844, 819), 1842.

Determined Synonymy.

Liparis Fabricii *Kroyer*, Naturhistorisk Tidskrift, ser. 2, B. ii., p. 274, 1847.

Liparis Fabricii, pp. *Reinhardt*, in Naturhistoriske Bidrag til en Beskrivelse af Grönland, 1857.

Liparis Fabricii, pp. *Gill*, Catalogue of the Fishes of the Eastern Coast, p. 47.

Liparis tunicatus, (Fabricii, Kr.) *Lütken* Videnskabelige Meddelelser fra den Naturhistoriske Forening i Kjöbenhavn, 1860, p. 173.

Liparis Fabricii *Kroyer*, Naturhistorisk Tidskrift, ser. 3, B. i., p. 235, 1862.

Laparis Fabricii *Günther*, Catalogue of the Fishes, &c., iii., 161, 1861.

Fabricius, in the Fauna Grœnlandica, refers to the *Cyclopterus liparis* of Linnæus, two forms of *Liparis* found by him in Greenland. To the first variety—" 1) Altera minor, *Abapokitsok*"—were attributed 39 dorsal, 33 anal, 30 pectoral, and 14 caudal rays; 4 *tubular nostrils;* a union of the *dorsal* and *anal* fins *wi h the caudal*, which latter is nearly cuneate, and a fuscous color; the jaws externally, the inferior ocular region and the opercula have rather indistinct white dots, and the tips of the upper pectoral rays being likewise white. This combination does not entirely agree with any of the Greenland species, as described by Kroyer, but most approximates to the *L. Fabricii*; from that species the number of caudal rays, (14) if correctly stated, would separate it, and the color is also, perhaps, inconsistent. I am fain, then, to leave the identity of this species in doubt, trusting that future material may enable us to arrive at a certain decision.

In 1835 or 1836, Reinhardt offered to the Danish Academy a Contribution on new Greenland Fishes, closing this contribution with the remark that "there also exists in the Greenland seas the *Cyclopterus liparis*, Fab., which is named *Liparis tunicata*, on account of the peculiar loose adherence of the skin, and which, in its characters, has much similarity with the European species illustrated by Yarrell, in his *British Fishes;* but, as the Museum had in its possession only one badly preserved specimen, no certain identification could be made."*

The name *L. tunicata* is thus solely based on the *C. liparis* of Fabricius, and as the first variety is the one fully described by that author, and consequently the type of his species, and, as Reinhardt's remarks on the similarity of the species to the European are only correct for that variety, the name *L. tunicata* must be connected with it.

But, in a subsequent communication on "*Liparis glutinosus*," Reinhardt's ambiguous language might lead one to suppose that he connected the name *L. tunicatus* with *only* the large variety of *Cyclopterus liparis* of Fabricius, he remarking that "Fabricius considered that the large Greenland species, the *Liparis tunicatus* (sic.) of the Museum, might well be the Stellerian *L. glutinosus*." However this may be, the name proposed by Reinhardt must be accepted with its first limitation, and share with the variety of Fabricius the doubts concerning its proper application.

The name *Liparis Fabricii* was subsequently proposed by Kroyer for the species under consideration, and being the first *known* to be applicable to it, is provisionally accepted.

The radial formula given by Günther differs considerably from that assigned by Kroyer, (B. 5, D. 42, A. 33—35, C. 12, Gthr.) and approximates to that of Fabricius, especially in the number of caudal rays.

LIPARIS MONTAGUI, Don.

Liparis Montagui *Kroyer*, Voyage en Scandinavie, &c., tab. 13, p. 1, a—f.
Liparis Montagui *Kroyer*, Naturhistorisk Tidskrift, ser. 3, B. i., p. 243.

Only the references to the Greenland form have been given. It may be remarked that while Kroyer, both in his Denmark's Fiske, (ii., 519) and the Naturhistorisk Tidskrift, has assigned 18 caudal rays to this species, Yarrell, Nilsson and Günther have only attributed to it 13 or 14. There are also some slight discrepancies between the proportions assigned to the species by different authors.

LIPARIS MAJOR, Gill.

Cyclopterus liparis, 2, Altera major, *Amersulak-Fabricius*, Fauna Grœnlandica, p. 136, 1780.
Cyclopterus liparis, major, *Walbaum*, Artedi Genera Piscium, p. 489, 1792.
Cyclopterus liparis, *B. Bonnaterre*, Tableau Encyclopedique et Methodique Ichthyologie, p. 28, 1788.
Liparis tunicatus, pp. *Reinhardt*, Oversigt over det Kongelige Danske Videnskabernes Selskabs Forhundlingar, 1835—6, p. vi., p. cxi.
Liparis tunicata, *Kroyer*, Naturhistorisk Tidskrift, ser. 3, B. i., p. 236, 1862.

This species appears to be the second variety of Fabricius' *Cyclopterus liparis*, to which were attributed a much larger size, (long. 10 unc. et lat. 4 unc.) and the formula D. 44, P. 40, V. 8, A. 35, C. 14. Subsequently, it was fully described by Kroyer, under the name *Liparis tunicata*, originally based, by

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* "Endelig sluttedes dette Bidrag med den Bemærkning, at der gives i det grönlandske Hav foruden *Fabricii Cyclopterus liparis*, som man kunde kalde *Liparis tunicata* formedelst Hudens særdeles löse Vedhængen, endnu en anden Art, der i sin Tegning har megen Lighed med den af *Yarrell* i hans *british fishes* aftegnede europæiske Art, men da Museet kun er i Besiddelse af et eneste ikke fuldstændigt Examplar kan en sikker Bestemmelse endnu ikke finde Sted."

Reinhardt, on the *Cyclopterus liparis of Fabricius as a whole.* Fabricius having only fully described his first variety, it appears advisable for that reason, as well as on account of its precedence, to identify the name with that one. The name given to the present species as a variety, by Walbaum, may, in that case, be accepted as its specific appellation.

Genus CAREPROCTUS, Kroyer.

LIPARIDINÆ with the oral cleft oblique, the lower jaw advanced; teeth simple and hooked; a rudimentary suctorial disk situated far forwards, under the anterior part of the eye, and little distant from it the anus, far behind which is the anal fin.

Type.—Liparis Reinhardi *Kr.*=L. gelatinosus *R.*

This very distinct genus is especially distinguished from *Liparis* by the characters mentioned in the generic diagnosis. We owe its establishment to Dr. Kroyer, its species having been previously confounded with *Liparis.* There are probably two species, one found in Kamtschatka, and the other, long confounded with it, a native of the Greenland waters.

CAREPROCTUS REINHARDI, Kr.

Liparis gelatinosus, *Reinhardt,* Oversigt over det Kongelige Danske Videnskabernes Selskabs Forhandlingar, 1844—5, pl. x., p. lxxvii., tr. Isis von. Oken, 1844, p. 819.
Liparis gelatinosus, *Gill,* Cat. p. 47.
Liparis Reinhardi, *Kroyer,* Naturhistorisk Tidskrift, ser. 3, Bd I., p. 252.
Careproctus Reinhardi, *Kroyer,* op. cit. i., p. 257.

Synopsis of the PLEURONECTOIDS of California and North-western America.

BY THEODORE GILL.

In conformity with a promise some time since made,[*] I now offer a Synopsis of the Pleuronectoids of California, and add descriptions of a new species, which is at the same time the type of a distinct genus, contained in a collection made by Dr. Cooper, of the Geological Survey of California, and kindly submitted to me for examination.

One of the genera admitted—*Uropsetta*—is known to me only through the description and outline figure of its type published by Dr. Ayres. That species was originally described as *Hippoglossus californicus,* but as it evidently did not belong to *Hippoglossus,* it was withdrawn by me from that genus, and taken as the type of a peculiar one. It has since been referred to the genus *Pseudorhombus* by Günther, but the Californian naturalist, in approximating it to *Hippoglossus,* appears to have interpreted nature more truly than the English one. *Uropsetta,* indeed, is apparently more closely related to *Reinhardtius* than to any other.

Four other species are only known through descriptions that are not sufficient to positively decide their true affinities. One is the *Platessa bilineata* of Ayres;[†] of this the "mouth, of *moderate* dimensions, the tip of the upper maxillary scarcely reaching the plane of the pupil of the lower eye;" the "single, even row of strong, *blunt,* conical teeth;" the dextral eyes; the "scales larger and more conspicuous than in any other fish of this tribe yet found on our coast;" and the recurrent lateral line appears to indicate that it is allied to *Lepidopsetta*; but the statement that "the scales of the anterior portion of the body are nearly smooth; further back they become gradually more and more

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[*] Proc. Ac. N. S., Phila., 1862.
[†] *Ayres,* Proc. Cal. Ac. i. 40.

ciliate, though none of them are so rough as in most Flatfishes. Those of the head cover the entire opercular region and cheeks, and in part also the inner-ocular ridge; those of the cheeks are *strongly ciliate*," forbid us to associate it in the same genus as *L. umbrosa*. If, however, *tuberculated* scales should be substituted for *ciliated* ones, nothing else in the description would militate against such a reference. Dr. Ayres, indeed, considers this species to be "allied to *P. dentata*, Mitch.," but as his ideas of affinity are extremely crude and unreliable, nothing may be learned from them.

The second has been named by Dr. Günther *Parophrys Ayresii*. The "broad band of villiform teeth on the blind side, and with a few on the colored one," approximates it to the same group as *Hypsopsetta* and *Pleuronichthys*. The mere statement that "the dorsal fin commences somewhat before the middle of the eye," and the neglect to describe the lips furnish us negative evidence of some weight that it is not congeneric with *Pleuronichthys cœnosus*,* in which the dorsal is *decurrent in front on the blind side*, and the *lips* are *plicated* as in Labroids,—characters which would not be overlooked by an observant naturalist. As in *Hypsopsetta*, the normal characters of those parts are presented, and as *Parophrys Ayresii* otherwise exhibits a concordance with that genus, it may be provisionally referred to it.

The third species—native of the seas between Kamtschatka and America—has been named by Pallas *Pleuronectes quadrituberculatus*, and has recently been referred by Dr. Günther to the genus *Parophrys*. The description of Pallas is perhaps insufficient to enable us to form a certain conclusion regarding its affinities, but the characters given—smooth body with rudimentary scales, lateral line very little decurrent anteriorly, and four tubercles on the head continuous with the lateral line—are characters found in *Pleuronectes* rather than in *Parophrys*. The cause of its reference by Günther to the latter genus is unknown, but whatever it may be, he has evidently entirely misunderstood that genus. Until we are better acquainted with the Pallasian species, it may be advisable to retain it in *Pleuronectes*, since no advantage would be gained by exchanging one doubt for another far greater.

A fourth species—*Pleuronectes cicatricosus* Pallas—is also apparently a true *Pleuronectes*.

I. Mouth small, the supramaxillary ending before under front of eye	PLEURONECTINÆ.
A. Teeth well developed, straight, blunt, and producing an incisorial edge, chiefly confined to the blind side: anterior nostril on eye side tubular; on blind with a posterior linguiform flap: posterior patulous, or nearly so.	
α. Eyes dextral.	
β. Lateral line with no recurrent or dorsal branch	*Pleuronectes*.
ββ. Lateral line with recurrent or dorsal branch.	
*. Cheeks with cycloid, imbricated scales	*Parophrys*.
**. Cheeks with stellated or tuberculated scales	*Lepidopsetta*.
αα. Eyes sinistral: scales scattered, stellated, or tuberculated, only unarmed cycloid behind	*Platichthys*.
AA. Teeth slender, acute, pluriserial. Anterior nostril on eye as well as blind side with flap behind; posterior patulous. Lateral line recurrent.	
α. Lips simple; dorsal continuous in front on dorsal ridge	*Hypsopsetta*.
αα. *Lips plicated;* dorsal in front decurved on blind side	*Pleuronichthys*.

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* Dr. Günther has referred *Pleuronichthys cœnosus*, Grd., to *Pleuronectes*, and *Pl. guttulatus* to *Parophrys*. His reasons for thus widely separating them have not been given, and are not obvious from a simple acquaintance with the literature or the species themselves. His characters of *Parophrys* are applicable to both species, but not to those of *Parophrys*.

II. Mouth large and continued more or less under the eye.
  Ventrals inserted laterally.. HIPPOGLOSSINÆ
 A. Caudal entire, or produced behind.
  α. Lateral line straight.. *Psettichthys*,
  αα. Lateral line arched in front.. *Paralichthys*.
 AA. Caudal fin emarginated behind.
  Dorsal and anal fins regularly arched........................ *Uropsetta*.
  Dorsal and anal elevated towards middle........................ *Hippoglossus*.
III. Mouth large. Ventral of dark side inserted on the ridge
  of abdomen.. RHOMBINÆ.
  α. Interorbital area sharp.. *Orthopsetta*.
  β. Interorbital ridge prominent, channelled........................ *Metoponops*.

Subfamily *PLEURONECTINÆ* Bon.

PLEURONECTES (L.) Blkr.

Pleuronectes Franklinii Gthr.

Pleuronectes (Rhombus) glacialis *Rich*, F. B. 258. (not *Pallas*.)
Pleuronectes glacialis *DeKay*, N. Y. 302.
Platessa glacialis *Rich*, Herald.
Pleuronectes Franklinii *Gthr.*
 Hab.—North-western America.

Pleuronectes quadrituberculatus Pallas.

Pleuronectes quadrituberculata *Pallas*, Zool. Ros. As. iii. 423.
Parophrys quadrituberculata *Gthr.*, iv. 456.
 Hab.—Sea between Kamtschatka and America.

Pleuronectes cicatricosus Pallas.

Pleuronectes cicatricosus *Pallas*, Ross. As. iii. 424.
 Hab. "Specimina e mari inter Camtschatcam et Americam lecta mihi retulit *D. D. Merk.*"—Pall.

PAROPHRYS Grd.

Parophrys vetula Grd.

Parophrys vetulus *Grd.*
Pleuronectes digrammus *Gthr.*, iv. 445.
Parophrys vetula *Gthr.*, iv. 455.
 Hab.—California.

Parophrys Hubbardii Gill.

Parophrys Hubbardii *Gill*, Pa., 1862, 281.
 Hab.—San Francisco.

LEPIDOPSETTA Gill.

Lepidopsetta umbrosa Gill.

Platichthys umbrosus *Grd*, Pa., viii., 136, 1856.
Lepidopsetta umbrosa *Gill*, Pa., 1862, 326.
Pleuronectes umbrosus *Gthr.*, iv. 454.
 Hab.—California.

Allied and perhaps congeneric is the following species:

Platessa bilineata *Ayres*, Cal. i. 40.
Pleuronectes bilineatus *Gthr.*, iv. 444.
 Hab.—San Francisco.

PLATICHTHYS Girard.

PLATICHTHYS STELLATUS Girard.

Pleuronectes stellatus *Pallas*, Nova Acta, i. 347.
Platessa (stellata) *Cuv.*, R. A.
Pleuronectes (Platessa) stellatus *Rich.*
Platichthys rugosus *Grd.*
" (stellatus) Grd.
Hab.—Western coast generally.

HYPSOPSETTA Gill, 1862.

HYSOPSETTA GUTTULATA Gill.

Pleuronichthys guttulatus *Grd.*, Pa., viii. 137.
Pleuronectes guttulatus *Gthr.*, iv. 445.
Hypsopsetta guttulata *Gill*, Pa., 1862, 330.
Hab.—Oregon and California.

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Parophrys Ayresii *Gthr.*, iv. 456.
Hab.—California.

"The height of the body is rather *more than one-half* of the total length" (in *H. guttulata*, $1 : 2\frac{1}{6}$—$1 : 2\frac{1}{3}$); "the length of the head *rather* more than one-fifth," (*H. gutt.* $\frac{1}{4}$ in young—$1 : 4\frac{1}{2}$ in old); "the distance between the dorsal and caudal is about one-third of the depth of the fore portion of the tail" (more); "the length of the pectoral *equals* the distance of the lower eye from the end of the operculum" (less).

Is it distinct from *H. guttulata*? The color of the latter in the adult is "uniform brownish lead colored."

PLEURONICHTHYS Grd.

PLEURONICHTHYS CŒNOSUS Grd.

Pleuronichthys cœnosus *Grd.*, Pa., vi. 139.
Parophrys cœnosus *Grd.*, iv. 456.
Hab.—California.

Subfamily *HIPPOGLOSSINÆ* Gill.

PSETTICHTHYS Grd.

PSETTICHTHYS MELANOSTICTUS Grd.

Grd., Pa., vii. 140.
Hab.—California.

PARALICHTHYS[*] Grd.

PARALICHTHYS MACULOSUS[*] Grd.

Pleuronectes maculosus *Grd.*, Pa., vii. 155.
Paralichthys maculosus *Grd.*, Exp., &c., x. 147.
Hab.—California.

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[*] *Paralichthys* would appear to be normally sinistral from two specimens collected by the Californian Geological Survey. One of these cannot be distinguished from *P. maculosus*, the proportions, number and arrangement of the blue dots being similar; the spots are normally—six dorsal, the first under eighth dorsal ray; the second above the axil of pectoral; the sixth under sixth ray from last, and the intervening equidistant, but the fourth lower; four anal correspond to the last four dorsal ones. In the sinistral specimen, there is also one behind the eye. In the second specimen in the collections, these spots are obsolete. *Paralichthys* is distinguished from *Chænopsetta* by its larger ctenoid scales, and small supernumerary linear cycloid ones.

UROPSETTA Gill.

UROPSETTA CALIFORNICA Gill.

Hippoglossus californicus *Ayres*, Cal. ii. 29, f. 10.
Pseudorhombus californicus *Gthr.*, iv. 426.
Uropsetta californica *Gill*, Pa., 1862, 330.
Hab.—California.

HIPPOGLOSSUS Cuv., Gill.

HIPPOGLOSSUS ——— ——.

Pleuronectes hippoglossus *Pallas*, Ros. As. iii. 421.
Hippoglossus vulgaris *Ayres*, Cal., i. 40; ii. 30.
Hab.—California northwards.

Subfamily *RHOMBINÆ* (Bon.) Gill.

ORTHOPSETTA Gill.

ORTHOPSETTA SORDIDA Gill.

Psettichthys sordidus *Grd.*, Pa., vii. 142.
Citharichthys sordidus *Gthr.* iv. 421.
Orthopsetta sordida *Gill*, Pa., 1862, 330.
Hab.—California.

METOPONOPS Gill.

METOPONOPS COOPERI Gill.

Metoponops Cooperi *Gill*, infra.
Hab.—California.

Description of a new Generic type of PLEURONECTOIDS in the Collection of the Geological Survey of California.

Genus METOPONOPS Gill.

Body rather elongated rhomboid, with the dorso-nasal outline nearly rectilinear, and with the caudal peduncle moderate, somewhat constricted.

Scales moderate, cycloid, oblong, or oval, imbricated, covered also with smaller supernumerary scales. *Lateral line* perfectly straight, but slightly decurrent anteriorly, continuous in simple tubes on each scale.

Head scaly, moderate, conic, with the oblique profile rectilinear; the snout somewhat elevated and subtruncated, and the interorbital ridge prominent sideways. *Eyes* sinistral, oval, rather large, situated almost entirely in the anterior half of the head, the lower lateral; the upper directed obliquely upwards: the *interorbital area* narrow, scaly, channelled between the eyes, and bordered by two ridges which converge above behind. *Nostrils* narrow, between snout and eyes and parallel with the former; the anterior with a long flap or bridle in front; the posterior simple. *Opercula* normal.

Mouth large and very oblique; the supramaxillary ceasing under the pupil of the eye, extended obliquely downwards behind, and with a semicircular arch at its upper angle. *Lower jaw* truncated in front, with a tubercle below. *Lips* very thin and simple. *Tongue* elongated, narrow and free.

Teeth equally developed on both sides, uniserial, approximated, subequal, rather small, curved conic and acute. *Palate* unarmed.

Branchiostegal rays seven. *Branchial membrane* deeply emarginated below.

Dorsal fin with its origin considerably behind the right posterior nostril, above or rather behind the anterior margin of the orbit, regularly arched, with its rays simple. *Anal* with its origin under or behind the inferior axil of the pectoral, and similar to the dorsal.

Caudal fin convex behind.

Pectoral fins pointed.

Ventral fins subjugular, inserted obliquely, with its rays approximated, and its innermost attached to the breast by a membrane.

The lower pharyngeal bones are entirely separated, compressed and laminar, with the body emarginated below and the posterior processes directed upwards, attenuated towards their ends; with the teeth pauciserial; of the inner row slender, elongated and acute, curved outwards in front and erect behind; of the outer much smaller, but similar in form. *Upper pharyngeals* three on each side laminar, each with a row of large, slender, curved teeth.

The branchial arches have compressed, pointed rakers, progressively decreasing in length from the first to the fourth arch, on which last they are short and triangular; each armed with small, slender teeth on their internal margins.

Metoponops is readily distinguishable by the characters above given, especially the prominence of the interorbital ridge and the consequent oblique position on the forehead of the upper eye, whose line of vision is upwards; the scaly channel of the ridge itself; straight lateral line; dentition, and the form of the lower pharyngeal bones, especially the paraboloid emargination below in front. It is apparently as closely related to its cohabitant of California, *Orthopsetta*, as any other, but that genus is at once distinguished by its compressed head and little prominent, narrow interorbital ridge.

METOPONOPS COOPERI Gill.

The height of the body is contained about three times in the total length; the head about four times, and the caudal six times and a half. The longitudinal diameter of either orbit equals about a third of the head's length. The snout is rhomboid, decurved in front, and its length from the lower orbit to the symphisis equals about a fifth of the head's length. The supramaxillary ends under the front of the pupil, and from the symphisis to its end enters twice in the distance between the chin and preopercular margin. The greatest height of the dorsal equals the length of the upper jaw, as well as does that of the anal. The pectoral fin equals about a sixth of the total length.

D. 89. A. 71. P. 13.

The color is uniform brownish.

A single adult specimen of this species is in the collection formed by the Californian Geological Survey, of which Prof. Whitney is the superintendent, and was obtained by Dr. Cooper, the naturalist of the Survey, at Santa Barbara, in May, 1863. This specimen is in poor condition, having been apparently obtained only after exposure for some time to the sun; the fins have been dried, and the pectorals and ventrals are more or less broken, especially the latter, while the abdomen is much injured. I am consequently compelled to omit some desirable details. The species itself is a very interesting one, and I give myself the pleasure of dedicating it to my friend, Dr. Cooper.

On the Affinities of several doubtful BRITISH FISHES.

BY THEODORE GILL.

Among the few still uncertain species of British fishes, none are involved in greater obscurity than those presented under the name of *Ophidium imberbe* by Pennant and Montague, and those referred by Hoy to the Linnæan *Trichiurus lepturus*. A detailed investigation into the literature and history of the former has enabled me to demonstrate its relations, and the discovery of a recent type in the Caribbean Sea permits me to at least suggest the affinities of the latter,* concerning which I had long been perplexed. These contributions to British Ichthyology are, with this introduction, especially submitted to the naturalists of Britain, to whom it remains to verify or disprove the validity of the conclusions arrived at. I shall only remark that the failure, after so long a period, to find any species more conformable to the notice of *Ophidium imberbe* than the one herewith identified with it, is itself most suggestive.

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* See Proceed. Acad. Nat. Sci. Phila., 1863, p. 228.

1. OPHIDIUM IMBERBE L., Montag.

For half a century a nominal species of fish has been retained in the catalogues of the British fishes under the name of "*Ophidium imberbe* L.," and in later times under that of "*Gymnelis imberbis.*" As no critical investigation into the history of this species has yet been given, it is thought that such will not now be superfluous, since thereby a name symbolic of no distinct organism may be eliminated from the systematic and faunistic works, and the false ideas connected in recent times by means of it with the geographical distribution of two remarkable genera be dissolved.

Commencing with the general introduction of the binomial nomenclature, Linnæus, in the tenth edition of the Systema Naturæ,[*] defined anew the genus *Ophidion*,[†] then placed by him at the end of the Jugulares, and assigned to it five branchiostegal rays, and *ventral fins with two rays, the external of which is spinous.* In the genus thus defined, he respectively placed, 1. *O. barbatum*. 2. *O. imberbe*. 3. *O. macrophthalmum*. The first has articulated bifid ventral fins modified as barbels,[‡] situated below the chin, and is the type of a family closely related to the Brotuloids[§] and Gadoids. The third is evidently the species afterwards described as *Cepola rubescens* by Linnæus,[∥] as was subsequently shown by Linnæus[¶] and Cuvier.[**] Thus, neither of these species answered to the terms of the diagnosis. The *Ophidium imberbe* was noticed in the words "O. maxillis imberbibus, cauda obtusiuscula, D. 79. P. 11. V. 2. A. 41. C. 18. Hab. in Europa." This diagnosis, in connection with the notice of the ventrals in the generic diagnosis, enables us at once to identify the species with the common *gunnell* of Europe, no other having even approximately such a radial formula. But references are made to the *O. cirris carens* of Artedi[††] and the *Fauna Suecica.*[‡‡] Artedi based his species in the "Synonymia" on, 1st, the *Ophidion flavum* vel *Ophidion imberbe* of Rondelet[§§] and the notices of the same derived from Rondelet by Willoughby[∥∥] and Ray; and, 2d, the *Ophidion flavum & imberbe* of Schonevelde[¶¶] and *Ophidion* of

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[*] Syst. Nat., ed. 10, 1259.

[†] "*Caput* nudiusculum.
"*Membr. branch.* patula radiis V.
"*Corpus* ensiforme. *Pinna* dorsalis anique unita caudæ. *Pinnæ ventrales* radiis duobus; exteriore spinoso."—*Linn.*, Syst. Nat., ed. 10, i. 259.

[‡] I have already shown that the so-called barbels of *Ophidion barbatum* are true ventral fins on account of their articulation and attachment, and not homologues with the barbels of the Mulloids and Polymyxioids.

[§] The *Brotuloids* form a very natural family, but its distinctive characters have hitherto been only hinted at. Among the most trenchant are the closure of the cranial cavity in front and the consequent development of a more or less complete bony septum; the compression downwards of the sides of the cranium and angularity below, and the great development of the exoccipitals, which unite and extend obliquely upwards behind the supraoccipital: the forms of the supramaxillars already described by me, and the development of a genital papilla in the males.

[∥] The *Cepola rubescens* must be called *Cepola macrophthalmus*. The diagnosis and radial formula "O. maxillis imberbibus, *pinna caudæ acuminata.*—D. 69. P. 15. V. 6. A. 62. C. 12. *Hab.* in M. Med.," enables one at once to identify the species.

[¶] Linnæus, Syst. Nat., ed. 12, ed. Gmel., 1187.

[**] Cuvier et Valenciennes, Hist. Nat. des Poissons, xi. 389.

[††] Artedi, Genera, 25. Syn. 42.

[‡‡] Linnæus, Faun. Suec., 289.

[§§] Rondeletius, lib. xiv. cap. 2, p. 398.

[∥∥] Willoughby, p. 113. Ray, Syn., p. 39.

[¶¶] Schonevelde, Ichthyologia, &c.,—quæ in florentissimis ducatibus Slesvici & Holsatiæ, &c., 1524, p. 53.

Schelhammer.[*] The first is a fish of the Mediterranean, closely resembling the *Ophidium barbatum*, according to Rondelet, but distinguished by its want of barbels and its yellow color; it has been identified by Cuvier[†] with his "*Donzelle imberbe*"—the *Fierasfer acus* Kaup. The second was evidently based on the *Muræenoides gunnellus* of authors, as Broussonet[‡] and Cuvier[§] have shown. The *Ophidion cirris carens* of the "Synonymia" is therefore a compound; that of the "Genera" is only based on the *Ophidion flavum & imberbe* Auctorum," (Schonevelde,) and said to inhabit the Baltic Sea; it is thus primarily the *Muræenoides gunnellus*. Artedi was apparently not acquainted through autopsy with any of his Ophidia.

The Ophidion of the Fauna Suecica, placed among the *Jugulares*, is also, without doubt, the *Muræenoides gunnellus*, of which Linnæus had not then mentioned the ventral fins. The formula of the fins in the tenth edition of the Systema is similar, but with the addition of the rays of the ventrals.

Subsequently, Gronovius, in the Zoophylacium,[‖] connected this name with a fish which appears to be nothing more than an *Ophidion barbatum*, of which the barbels had been destroyed, as Cuvier[¶] suggests, or concealed within the limbs of the lower jaw and overlooked, as may readily be the case. We might have hoped to have had this question solved by Dr. Günther, as, according to Dr. Gray,[**] the Gronovian fish was in the collection purchased for the British Museum; Dr. Günther has, however, not referred to the specimen in his Catalogue.

Pennant[††] next affixed the same name to a fish found near Weymouth, and communicated to him by the Duchess of Portland, giving a figure of it in the fourth volume of his British Zoology, but no description. This fish is apparently a common eel, as Broussonet[‡‡] and Cuvier[§§] have suggested; probably Pennant and his friends were deceived by some anomalous appearance of the fish itself, as it appears to have been shorter than usual. There is, at least, nothing but the eel found in European or, indeed, any other waters, which at all resembles the fish figured by Pennant.[‖‖]

In a subsequent edition of the British Zoology, this figure was replaced by one in the meanwhile published by Montague under the name of *Ophidium imberbe*.

Such is the essential history of the applications of the name of *Ophidium imberbe* down to the year 1777. The age of compilers, commencing with Haüy and culminating in Lacépède, Bloch, Schneider and Shaw, soon after commenced. These authors variously combined the notices of their predecessors, and finally succeeded in involving a species, concerning which there was no reasonable room for doubt, in such mystery that almost all memory of the original type was eventually lost.

Haüy, in 1788, in the Encyclopédie Méthodique,[¶¶] adopted in his description of the "*Imberbe*,"—*Ophidion imberbe*,—the colors as well as very low dorsal fin from Rondelet, but at the same time described the dorsal with Schonevelde as a very stiff, rigid one—still considering it a *Malacopterygian!* Also stating that, according to Gronovius, there were 147 dorsal rays and 101 anal, among which the caudal were included, he recalled that Linnæus distinguishes the three fins, assigning to the dorsal 79 rays, to the anal 41 and to the caudal 18, and the combination of these, according to our author, forms 238 (sic!) rays, 10 less than that which results from the enumeration of Gronovius! He concludes by giving with Gronovius quite large, lanceolate pectorals with 26 rays; and, finally, with remarks on its habitat from Rondelet. The description is thus based only on three species belonging certainly to as many very distinct families; but, in his synonymy, he includes references to the *Sea snail* of Petiver[*] and the *Congrus* of Aldrovandi,[†] the one representing a *Liparis*, and the other a true *Conger*, representatives of two more families. It must, however, be added, somewhat in extenuation for Haüy, that the last two, singularly enough, originated with Gronovius, perhaps the most sagacious and learned ichthyologist of the past century.

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[*] Schelhammer, De Anatome Xiphiæ piscis uti *Lumpi* et *Ophidii*, p. 23.

[†] Cuvier, Mém. du Museum, i. 1815, pp. 312, 313.

[‡] Broussonet, Phil. Trans., London, lxxi 1781, p. 438.

[§] Cuvier, op. cit., i. pp. 315, 316.

[‖] Gronovius, Zoophylacium, 1763, No. 401.

[¶] Cuvier, Mem. du Museum, i. 1815, p. 316.

[**] Catalogue of Fish Collected and Described by Lawrence Theodore Gronovius, now in the British Museum, London, 1854, (Ophidion congrus, B. M., p. 164.)

[††] Pennant, British Zool., iv. 1, App , 398, iv. pl. 93.

[‡‡] Broussonet, Phil. Trans., lxxi. 1781, p. 439, *note*.

[§§] Cuvier, Mem. du Mus., i. 1815, p. 316.

[‖‖] Mr. Templeton, in 1837, announced that "the only specimen (of *O. imberbe*) I have observed, was thrown on the shores of Belfast Lough, near the White House Point, on January 9, 1809. It was a large specimen, not less than a foot long, and agreed so exactly with the figure in the British Zoology, and differed so much from that of Mr. Montague (Wern. Mem., p. 95, pl. 4), that I am led to believe there are two distinct species, of which Pennant has described one and Montague the other."—*Mag. Nat. Hist.*, N. S., i. 412. Mr. Thompson (N. H. Ireland, iv. 1856, p. 233), was unable to gain further information. If the specimen was not a thick eel, it may have been a *Zoarces viviparus*.

[¶¶] Encyc. Meth. Hist. Nat., iii. Poissons, p. 212.

Bonnaterre,[‡] engaged on the same great work, followed Haüy, and concluded his notice with the radial formula B. 7. D. 238. P. 26. V. 0. A. 0. C. 0., which is evidently the result for the dorsal of the sum so singularly obtained by Haüy from the combination of the numbers attributed by Linnæus to the dorsal, anal and caudal fins, while the numbers of the pectoral and branchiostegal rays are derived from Gronovius; the negation of the anal and caudal fins is peculiar to the author himself.

Gmelin[§] included in the synonymy of the Linnæan species the references to the *Ophidion* of Gronovius,—placing the radial formula of the latter immediately under that of Linnæus,—as if to draw attention to the remarkable difference between the two which he could not himself appreciate,—and also referred to Pennant's figure.

Walbaum,[‖] in his edition of the "Genera of Artedi," simply added the notices from the Fauna Suecica and Schonevelde, as well as a reference to the figure of Pennant, with the opinion of Broussonet concerning the same.

Lacépède[¶] obtained from Linnæus, for his notice, the rounded caudal fin and radial formula, and from Rondelet the yellow color and its Mediterranean habitat, while his information regarding the delicacy of its flesh in common with that of the *O. barbatum* is orginal, and serves well to open a paragraph.

Shaw[**] copied his notice from Gronovius.

Bloch, or his editor, Schneider, gave to the species the name *Ophidium "Chinense"!* at the same time depending *entirely* on the Fauna Suecica of Linnæus for information relative to its habitat,—("*Habitat in mari baltico et oceano, reperitur sæpe intra ostrearum testas*"); and, while also deriving his knowledge of its characters for his text from the same source, copied Pennant's figure as illustrative at once of the species and the genus.[††]

Cuvier arising, dispelled the obscurity which involved the history of so many of the most common European Fishes in his remarkable series of Memoirs on the Fishes of the Mediterranean. In that on the *Ophidium imberbe*, (De la Donzelle imberbe,) he demonstrated that the *Ophidium imberbe* of Rondelet, and his copyist Willoughby, was distinct from that of Schonevelde, Schelhammer and Linnæus; that the first was related to *Ophidium barbatum*, and the second identical or very closely allied with the *Blennius gunnellus* of Linnæus; that the *O. imberbe* of Gronovius was a true *Ophidium* deprived of barbels, and that Pennant's fish was an eel.[*] He was unable to determine a fish noticed by Montague under the same name. While therefore the *Ophidium imberbe* was eliminated from the Catalogues of Fishes of Continental Europe as a distinct species, it still held a position among those of England. To the consideration of this English fish we now proceed.

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[*] Petiver, Gazophylacium, tab. 51, fig. 3.

[†] Aldrovandi, Pisc., lib. iii. cap. 25, fig p. 349.

[‡] Bonnaterre, Tab. Encyc. et Meth., *Ichthy.*, 1788, p. 41.

[§] Linnæus, Syst. Nat., Gmelin's ed., 1788, p. 1147.

[‖] Artedi, Gen. Pisc., Walbaum's ed., 1792, p. 157.

[¶] Lacépède, Hist. Nat., ii. 1800, p. 279.

[**] Shaw, Gen. Zool., iv. 1803, p. 70.

[††] Bloch, Syst. Ichth., Schneider's ed. p. 486.

In 1811, in the Memoirs of the Wernerian Society, Montague[†] described and figured the fish identified by him with the *Ophidium imberbe*. It was "taken on the south coast of Devon," and in "length was *about* three inches;" the body "ensiform;" "the dorsal fin commences immediately above the base of the pectoral, and is at first not so broad, and usually not so *erect* as the other part," and the caudal is cuneiform and obtusely pointed. "The color is purplish-brown, disposed in minute speckles; and along the base of the anal fin are about ten small bluish-white spots regularly placed, but scarcely discernible without a lens, possibly peculiar to younger fishes." The rays were respectively—pectoral 11; dorsal about 74; anal 44; caudal 18 or 20. Such was the first detailed account of *Ophidium imberbe*, based on a British fish, and such the authority on which the subsequent British faunists have preserved the species in their catalogues. By Turton,[‡] Fleming,[§] Jenyns,[||] Yarrell,[¶] Gray,[**] &c., it has been retained in the genus *Ophidium* (§*Fierasfer*), while more recently, Kaup,[††] Richardson[‡‡] and Günther[§§] have transferred it to the genus *Gymnelis;* the first originally under the name of *Cepolophis.*[||||] It remains to examine into the grounds for such approximations.

It is not probable that a fish whose dorsal arrested the attention of Montague on account of its being so "erect," could have been a Malacopterygian, and this character as well as the distinctness of all the rays, the development of the caudal, whose rays are longer than those of the dorsal and anal, the relations of the various parts, and even the gill-membranes inflated beneath, render it evident that the fish in question could have been in no wise related to either *Ophidium*, *Fierasfer*[1] or *Gymnelis*,[2] all of which are *Malacopterygians*, with caudal rays shortest and not developed as a distinct fin. Its affinities are then to be sought for in another direction. The general form, the "erect" dorsal fin and the number of rays, agree with *Murænoides gunnellus*. The color is in that species sometimes simply "purplish-brown," the dorsal spots becoming obsolete, and, in a single specimen from England in the Smithsonian collection, several anal spots are barely discernible.[3] The failure to observe the ventrals was shared with Schonevelde, Schelhammer, Linnæus, &c., and we are more prepared for their non-observance by Montague when we remember his peculiar views concerning the ventral fins.[*] Objections may be urged against this identification, that Montague would have recognized the *Murænoides gunnellus*; that the proportions represented in his figure are not precisely equivalent to those of that species, and that the critical Cuvier and all succeeding naturalists have failed to notice the identity. I shall only recall the admission that Linnæus himself, after autopsy, referred one specimen of the same species to *Blennius* (*gunnellus*) and another to *Ophidion* (*imberbe*); that Montague wrote, in the year 1812, and in the infancy of ichthyology, when the importance of attention to minutiæ was less generally appreciated than now, and that the identification of his fish with *Murænoides gunnellus* was probably stayed by the improbability of his failure to recognize that common species.

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[*] Cuvier, Mem. du Museum, i. 1815, 312—324.

[†] Montague, Mem. Wern. Soc., i. 1811, p. 95, pl. 4. fig. 2.

[‡] Turton, Brit. Faun., 1807, p. 88.

[§] Fleming, Brit. An., 1828, p. 201.

[||] Jenyns, Man., 1835. p. 281.

[¶] Yarrell, Br. Fishes, ii. 1841, p. 412.

[**] Gray and White, List Br. An. B. M., Fishes, 1851, p. 51.

[††] Kaup, Cat. Ap. Fishes, 1856, p. 156.

[‡‡] Yarrell, Br. Fishes, Richardson's ed., i. p. 79 (*fide* Gunther.)

[§§] Gunther, Cat Fishes, iv. 1862, p. 325.

[||||] Kaup, Arch. für Nat., 1856, i. p. 97.

[1] *Fierasfer* Cuv., is the type of a peculiar family related to the Opidioids, but with the anus thoracic or jugular, the body much attenuated backwards, and the anal fin longer and higher than the dorsal; it embraces four genera.—*Fierasfer* Cuv., or *Carapus* Raf. (not Cuv.), *Encheliophis* J. Muell.,—*Echiodon* Thompson,—the latter of which is the only British type, and *Helminthodes* Gill, (type *Oxybeles lumbricoides* Blkr.,) distinguished by its very slender form.

[2] *Gymnelis* Reinh., is the representative of a peculiar family (*Lycodoidæ*), allied to the Brotuloids, but with the branchial apertures more or less restricted, the ventrals rudimentary or obsolete, the skull oblique behind, the supraoccipital bone being deflected downwards, wedged between the exoccipitals, and with its point and low crest continued almost or quite to the foramen magnum; the cranial cavity is open in front, no osseous septum being developed. This family is only represented by the genus *Enchelyopus* or *Zoarces* in the European seas, which, as J. Müller (Arch. fur Nat., 1843, i. 294) has shown, is truly Malacopterygian.

[3] These light spots are accidental, none being developed in other specimens from England, Denmark and the German Ocean.

As Dr. Günther, in the synonymy of "*Gymnelis imberbis*,"[†] has represented the ideas of the English naturalists; and, as his work is the last authority referring to it, an analysis and reduction of that synonymy to its proper elements will form a fitting conclusion to these remarks.

1. Murænoides[‡] gunnellus ex L.

Ophidium imberbe *L.; Montag.; Turton*, 88; *Fleming*, 201; *Jenyns*, 481; *Yarrell*, ed. 1, ii.; ed. 2, ii. 412.
Cepolophis Montagui *Kaup*.
Gymnelis imberbis *Kaup*, Ap. *Rich.* in *Yarrell*, ed. 3 (fide *Gthr.*)

2. Carapus[§] acus Raf. ex Brun.

Ophidium imberbe *Lac.*, pt. (Radial formula and caudal fin of *Murænoides gunnellus.*)

3. Muræna[||] anguilla L. or allied sp.

"Beardless Ophidium *Pennant*," Brit. Zool., iii. 398. App., tab. 93.

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[*] The reference by Dr. Shaw of *Vandellius lusitanicus* (= *Lepidopus caudatus*) to the thoracic order, "caused the obscurity of *Vandellius lusitanicus*, as no one could have expected to have found an Apodal fish placed in that division. How that naturalist could have fallen into such an error, I cannot conceive, unless he considered the pair of ventral scales as rudiments of those fins, or what is commonly attached to the base of the ventral fins of some fishes, as may be observed in many Spari." "I am aware that it has been contended that these abdominal scales are lamellated ventral fins. If so, we have yet to learn the definition of a fin in the modern revolution of science. Those who contend for the continuance of *Vandellius* of Shaw or for the *Lepidope* of Risso being continued in the Thoracic order, must also constitute a new order for many fishes that have such lamellated appendages, independent of two ventral fins. But I cannot admit of a simple corneous scale, destitute of motion, being a ventral fin."—Montague, in *Mem. Wern. Soc.*, ii. 1818, pp. 432, 433.

[†] Dr. Günther remarks, that the *Gymnelis stigma* and *G. imberbis* "probably do not belong to this genus."

Gymnelis stigma—Ophidium stigma *Lay and Benn.* (sic)—is probably congeneric with and perhaps even closely related to *G. viridis*; and it at least greatly resembles some varieties of that variable species. The poor figure and the assignment of "very small" scales to it led me, on a former occasion, to think otherwise, like Dr. Günther: but we must remember that the notes and illustrations of *Ophidium stigma* were made by an inexperienced naturalist, and that he may have been deceived as to the presence of scales. However, we may also recall that there is a great variation in squamation in a genus representing a closely related subfamily,—(*Lycodes.*)

[‡] The question will naturally arise among those who contend that we should date our nomenclature from the tenth edition of the Systema Naturæ—that being the first in which the binomial system is introduced—whether we should not replace the name *Murænoides*, *Centronotus*, or *Gunnellus* by *Ophidion*. Perhaps this will eventually be done, since the genus was well defined and its diagnosis only applicable to the *O. imberbe*. Others may contend that the name must be retained for the first species—(*O. barbatum*)—in spite of its total disagreement. The decision of this question may be suspended till the publication of the new rules of the British Association.

[§] The name *Carapus* was first connected with the *Gymnotus acus* by Rafinesque (Ind., 1810, p. 37, 57), who only referred to that species, although he doubtless intended his genus to correspond with Lacépède's anonymous second subgenus of *Gymnotus*, which included the *Gymnotus carapus* L., *G. acus* L. (= Fierasfer acus *Kaup*) and *G. rostratus* L. (= *Rhamphichthys rostratus* M., T.) A strict adherence to the laws will, however, necessitate the retention of the name for the only species mentioned—(*C. acus.*)

[||] Bleeker is doubtless correct in retaining the name *Muræna* for the *M. anguilla*. The name was restricted to the type represented by that species by Bloch, who first subdivided the genus, and the *M. anguilla* was evidently the one on which Artedi and Linnæus based their diagnoses.

2. "TRICHIURUS LEPTURUS."

The question which we shall next consider relates to the specimens identified by Mr. James Hoy* with the *Trichiurus lepturus* of Linnæus.

In the Transactions of the Linnæan Society, Mr. Hoy has published an account of two fishes stranded at considerable intervals of time "upon the shore of the Moray Frith, near the fishing village of Port Gordon." The first specimen was found "on the 2d of November, 1810, after a high wind from the north:" "its head was much broken;" "the extremity of the upper jaw, or upper part of the mouth, was entire; upon *either side of which was an operculum;*" "the body, from the gills to the point of the tail, was three feet two inches long; its greatest breadth six inches and a quarter, and its greatest thickness only an inch;" "both sides of the fish were wholly white, without a spot upon them;" "the dorsal fin was the only part of a different color, being a blackish-green; this ran all the way back from the gills to the tail;" "the tail ended in a point, consisting of three or four soft spines or bristles of different lengths, not exceeding two inches. The body was nearly of the same breadth for one half of its length, and then its breadth diminished gradually till within three inches of the tail, when the diminution became more quick. The lateral line was straight, and strongly marked along the middle of the two sides."

The second specimen was obtained "on the 12th of November, 1812;" "its head had been broken off and was quite gone; a small bit of the gills only remained about the upper part of the throat, from whence to the extremity of the tail its length was twelve feet nine inches; its breadth, eleven inches and a quarter, was nearly equal for the first six feet in length from the gills, diminishing gradually from thence to the tail, which *ended in a blunt point,* without any of those kind of bristles which projected from the tail of the one found formerly; its greatest thickness was two inches and a half; the distance from the gills to the anus forty-six inches. The dorsal fin extended from the head to the tail," &c. "There were no ventral nor anal fins; but the thin *edge of the belly was closely muricated with small hard points,* which, although scarcely visible through the skin, were very plainly felt all along it. Both *sides* of the fish were *white, with four longitudinal bars of a darker color;* the one *immediately below* the dorsal fin was about two inches broad, each of the other three about three-fourths of an inch. *The side line straight along the middle.*"

On the authority of these specimens, the *Trichiurus lepturus* was admitted by the British Faunists in the Catalogues of their fishes.

Dr. Fleming† considered that the two specimens belonged to different species. "The differences in the position of the vent, the structure of the tail, and the condition of the edge of the belly, seem too great to justify the inference of their being only varieties. The latter fish appears identical with the *Lepturus* of Artedi, and consequently of Linnæus."

Subsequently, Dr. Fleming‡ considered that "the position assigned to the vent, the absence of ventral fins, and the white color of the sides, (of Hoy's first specimen) all accord with the Deal-fish, (*Trachypterus.*) The color of the dorsal fin, however, which was of blackish-green, seems to oppose this view, though the dead state of the fish may probably serve to explain this difference, if duly considered."

Repugnant as must be such perversions of names, consideration for the uniformity of nomenclature, which may best be attained by strict adherence to the laws, seems to require assent to them. The genus *Anguilla* is generally attributed to Thunberg, but a search instituted among his various memoirs has failed to reveal any mention of it, and it is to be remarked, that no naturalist has referred to any precise work. Prof. Agassiz, indeed, refers to "Anguilla *Thunb.*, Nuov. Mem. Stock., 179—." but no such generic name is to be found in the series referred to under that title.

* *Hoy* Trans. Linn, Soc. xi, p. 210.

† *Fleming*, Br. An., 1828 p. 204.

‡ *Fleming*, Loudon's Mag. N. H. iv., 1831, p. 219.

Mr. Jenyns[*] was inclined to adopt Dr. Fleming's opinion—"that the first specimen of Hoy was a distinct species, if not belonging to a different genus. There can be no doubt that the one described above (Hoy's second specimen) was a true *Trichiurus*, and probably *T. Lepturus* of Linnæus and other authors; but as the description is rather imperfect, and the species of this genus ill determined, it is impossible to speak with certainty on this last point."

Yarrell[†] especially alluded to the median lateral line and lateral bands, and remarked that "it is evident that more information on the subject is required; the result of it may be the establishment of Mr. Hoy's second fish as a new species of *Trichiurus*, and of his first fish, which is evidently distinct from the second, as the type of a new genus, if, as Dr. Fleming has suggested, it was not a mutilated example of the Deal-fish of the Arcadians, *Gymnetrus arcticus*."

With enlarged opportunities for arriving at a possible decision concerning at least the second specimen, I proceed to institute inquiries into the nature of these materials. The form and approximately the proportions noticed by Hoy, the "operculum on each side" of the mouth, simulated by the supramaxillars, the soft dorsal rays, the bristles at the end of the tail, the strongly marked straight lateral line appear to indicate, as Fleming has suggested, that Hoy had before him, in his first specimen, a much injured example of *Trachypterus* with most of its fins destroyed, and it is probable that a hole, caused by the caducous ventral fins, might have been mistaken for the anus;[‡] this may seem very remarkable, but it is evident that Mr. Hoy has not the slightest claim to scientific consideration, and the hole so created in *Trachypterus* would correspond in space to the "anus" discovered by that gentleman. A thoracic anus is incompatible with the structure of the Trachypteroids or any related forms. The "blackish-green" color of the portion of the dorsal remaining might have been due to discoloration, and we need not be much astonished that the lateral dorsal spots were overlooked in such a specimen.

The second specimen of Hoy evidently belonged to an entirely different type. The form and "closely muricated" belly indicate that it was related to the family of Lepturoids or Trichiuroids, but the "blunt point" in which the tail terminates, as well as the median lateral line, forbid us, on morphological grounds alone, from referring it to *Trichiurus lepturus*. It might have been supposed to have been a specimen of *Lepidopus caudatus*, were it not for the color, but that, sustained by the superior height, forbids us to refer it to that species. What then can it have been?

In the summer of 1863, I received from the learned Cuban naturalist, Prof. Poey, of the University of Havana, a fish, concerning whose systematic position he was unable to satisfy himself. This fish was found to resemble *Lepidopus caudatus* in all essential characters except the remarkable form of the head, which was exceedingly compressed, trenchant and obliquely decurved above, with the forehead elevated above the eyes, and the chin obtuse. Notwithstanding such characters, its affinity to *Lepidopus* was evidently so great, the form, structure of the fins, especially the anomalous form of the pectorals, and the development of the opercular bones coinciding, that I felt compelled to retain it in the same subfamily, in contradistinction to one containing *Trichiurus* (= *Lepturus* Art.) and *Eupleurogrammus*.[§] The color arrested my attention, there being six or seven narrow bands, the lateral line running through the fourth; the interval between the two dorsal bands was more indistinct, and the two could readily be confounded; the width of the two would equal about a sixth of the height, while the width of the single ones was contained about fifteen or sixteen times in the height. The two lower bands were more indistinct. I was therefore at once reminded of the *Trichiurus lepturus* of Hoy, and the similar development of the bars, as well as the approximation in proportions, compel me to believe that the second specimen of Hoy is in reality a species of the genus *Evoxymetopon*, if not indeed identical with the Cuban fish itself, (*Evoxymetopon tæniatus* Poey.) The greatest height of the latter, at the scapular region, is contained scarcely more than twelve times (12 1-5th) in the extreme length, while a short distance behind, and for a considerable distance, it is contained from thirteen and a half to fourteen times. The head enters eight times and a half, and the caudal, at its longest rays, twenty-nine times and a half in the same. The anus is midways between the snout and root of caudal. In this last respect it disagrees with the specimen signalized by Hoy, according to whom the anus was very considerably within the limits of the first third of the length (46 : 153 $+\chi$). Such a position is extremely improbable in a representative of the subfamily of Lepidopodinæ, to which the specimen doubtless belongs. The true anus, on account of its small size, was probably overlooked, and a rupture of the skin mistaken for it. May we not hope that some British naturalist will soon release us from our doubts, and verify the systematic position of Hoy's fish?

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[*] *Jenyns*, Manual 1835, p. 372.

[†] *Yarrell*, Br. Fishes, i, 1841, p. 201 (207.)

[‡] This same mistake, indeed, was made in the communication by Dr. Duguid to Dr. Fleming, concerning the same fish, (see Loudon's Mag. iv., 1831, pp. 215, 216,) and Dr. Fleming, himself, so far from correcting the error, alluded to the similarity of the so-called vent as evidence of the pertinence of Hoy's fish to the same species, (op. cit. iv., 219). By a somewhat singular coincidence, the same error in identification of the *Trachypterus* with the *Trichiurus lepturus* was made by Olafsen (Voyage to Iceland, p. 59½.)

[§] Gill, "Synopsis of the Family of Lepturoids, and Description of a Remarkable New Generic Type," in Proc. Ac. Nat. Sc., Philadelphia, 1863, p. 224. &c. In this article I have suggested the relation of Hoy's fish and *Evoxymetopon tæniatus*.

POLYPROSOPUS Couch.

Having provisionally adopted the generic name *Polyprosopus*, proposed by Couch, in the "Analytical Synopsis of the Order of Squali," remarking at the same time that the genus was "not yet well established," it seems advisable now to express my conviction that it belongs to the genus *Cetorhinus* or *Selache*, and that the differences observed are probably due to distortion or defective observation. I have already stated that "the absence of caudal carinæ or spiracles is quite improbable," and certainly no scientist could believe in the absence of the anal fin in such a type.

I may finally be permitted to add, in anticipation of a more extended memoir, remarks on the Lemniscates of Richardson, and more especially the *Leptocephalus Morrisii* Gm. The recent exposition of the character of such fishes, by Professor V. Carus,[*] will excuse this anticipation. I am happy to be able to express my unqualified belief in the conclusion as to their being simply larval forms, which that learned naturalist has enunciated. As long as the known hyaline fishes conformed to a single type, naturalists might be excused for regarding them as fully developed forms, but the doubt this group was first subjected to by the failure of Kölliker[†] to find organs of generation was increased by the addition by Kaup of the genus *Esunculus*,[‡] and subsequently of *Stomiasunculus*.[§] Carus was therefore, I think, fully justified in his "conclusion that all these fishes are nothing but *larval forms* of others," but he was not so happy in looking for the adults "among the Ophidians, or other compressed forms, (*Cepola*, and so on.)" I am almost certain that the typical *Leptocephali*, at least, are the young of *Congers*, and that *Leptocephalus Morrisii* is the young of *Conger vulgaris*. I am aware, indeed, that Yarrell[‖] has discovered that small congers, "about the size (length?) of a man's finger, are found among the rocks, close to land, during the summer." But he immediately afterwards adds that, "the small eels which ascend the Severn in such numbers in the spring, and were considered by Willoughby and Pennant as the young of the Conger, are in reality the young of fresh-water eels." May we not go a step farther and ask that it may be *demonstrated* that those "found among rocks, close to land," are Congers, and not eels, which have not yet commenced to ascend the rivers?

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[*] *Carus* "on the Leptocephalidæ," in Rep. Br. Ass. 1861, p. 125.

[†] *Kolliker*, Zeitschrift fur Wiss. Zool. iv., p. 360.

[‡] *Kaup*, Apodal Fishes, 1856, p. 143, fig. 3.

[§] *Kaup*, An. Mag. N. H. (3) 1860, p. 270.

[‖] *Yarrell*, Br. Fishes ii., 1841, p. 404.

The *Hyoproprus Messinensis*[*] appears, likewise, to be merely the larval form of the Congroid *Nettastoma melanura*.[†] The resemblance between those two forms will be readily appreciated, by reference to Dr. Kaup's figures of the two. Perhaps the affinities of those Leptocephali with an expanded caudal, are to be sought for elsewhere. As to *Esunculus costai*, it resembles the young of a Clupeoid, but the high insertion of the pectoral fins, if existent in nature, forbids for the present its positive identification with such. *Stomiasunculus* resembles, in general features, a less advanced larval Clupeoid, about three days old.[‡] in which the ventral fins have not yet appeared. Suspicion, however, may be entertained that it may, perhaps, be the young of some other type, (possibly Stomiadoids) on account of the backward position of the dorsal fin. I have myself, in company with a friend, seen the young of Clupeoids, which would have either been referred to *Esunculus*, or considered as the type of a closely allied new one, on account of the inferior insertion of the pectoral fins, and so transparent were they, that their eyes alone indicated their position in the water. Although entertaining no doubts concerning the larval nature of *Esunculus* and *Stomiasunculus*, I only venture to suggest the possible relations with much reserve. As to *Porobronchus*, Kaup.,[§] it is, perhaps, related to *Fierasfer*, but the character of the first elongated dorsal ray requires to be known, before a decision can be arrived at.

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Note on the family of STICHÆOIDS.

BY THEODORE GILL.

There have been referred to the family of Blennioids a number of more or less elongated fishes, somewhat recalling to mind the *Gunnells*, but with the body more tapering backwards and covered with scales; the head comparatively elongated and produced towards the snout; the skull depressed behind the eyes; the branchial apertures produced forwards; the dorsal fin composed of spines; and the stomach cæcal, and also distinguished by the development of cæca around the pylorus. This combination of characters seems to indicate the necessity of the separation of the fishes so distinguished from the family of Blennioids, one of the principal characters assigned to which, by authors of even the most recent date, has been the want of cæca. The named genera known are *Leptoblennius* Gill, *Lumpenus* Reinh., *Leptoclinus* Gill, *Stichæus* Reinh., and *Chirolophis* Sw. (Carelophus *Kr.* = Blenniops *Nilss.*) For this assemblage the name Stichæoidæ may be appropriated.

Nearly related to this family is that of Cryptacanthoidæ, proposed in the "Catalogue of the Fishes of the Eastern Coast." As there is, however, considerable difference in the form and development of the head, and the ventrals are likewise obsolete, it would scarcely be advisable to combine them and the Stichæoidæ in one family. There are five pyloric appendages in *Cryptacanthodes*. The genus has none of the peculiar characters of the

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[*] *Kolliker* Verh d. Phys. Med. Gesellsch in Wurzburg; iv., p. 101.

[†] *Raf.* Caratteri, &c., 1810, p. 66, tav. 16, f. 1.

[‡] See *Sundeval* "Om Fiskyngels Utveckling" in Kongl. Vet. Akad. Handl. i., 1855, tab. iv., fig. 6.

[§] *Kaup.* An. Mag. N. H. (3) vi., 1860, p. 272.

Cataphracti, nor has it any resemblance to any genus of that group. It evidently is closely related to the Blennioids, and has even been referred to that family by Dr. Günther, who was unacquainted with its anatomy.

Also allied to the Stichæoids is the genus *Cebedichthys*, a herbivorous fish with a very long intestinal canal, and well developed cæca, inhabiting the Pacific waters of the United States. The structure of the dorsal fin, the want of ventral fins, and the form of the head, for the present detain us from referring it to the family.

Such are, in brief, the characters and relations of the family of Stichæoids. It is now proposed to submit a corrected list of the species found in the north-eastern American seas, and to give the distinguishing characters by which the various genera may be recognized.

Synopsis.

I. Body much elongated. Lateral line obsolete. D. 59—80.
  α. Pectoral fins ovate, regularly convex behind.
    * Teeth on the jaws alone.
      † V. I. 4. Body robust. D. 60—65 (63); A. I. 42; anterior dorsal rays graduated and united.. Centroblennius.
      †† V. I. 3 (—2) Body extremely elongated. D. 69—80; A. 48—55; Anterior dorsal short and nearly free............................ .... Leptoblennius.
    ** Teeth on the jaws and vomer.
      † B. 7. Anal nearly uniform. Caudal acute.... Lumpenus.
      †† B. 6. Anal at its anterior half depressed. Caudal rounded......... .... Anisarchus.
  β. Pectoral fins with the upper rays abbreviated. Caudal subtruncated.
    *** Teeth on the jaws, vomer and palatines......... Leptoclinus.
II. Body moderately elongated. Lateral line more or less developed.
    * Lateral line single, superior.......................... Stichæus.
    ** Lateral line with superior and median branches united in front, the median longest............ Eumesogrammus.

CENTROBLENNIUS Gill.

CENTROBLENNIUS NUBILUS Gill.

Lumpenus nubilus *Rich.*, Last Arctic Voyages, p. 359, pl. 28. *Gthr.* iv., 564.
Centroblennius nubilus *Gill*, Cat. 45.

D. 63. A. I. 42. C. 17. P. 16. V. I. 4.

Hab.—Wellington Sound.

LEPTOBLENNIUS Gill.

LEPTOBLENNIUS SERPENTINUS *Gill* ex *St.*

Blennius serpentinus *Storer*, Proc. Boston iii. 30; Mems. Am. Ac.
Leptoblennius serpentinus *Gill*, Proc. Phila. Cat. 44.

Hab.—Massachusetts, Maine.

This species, originally founded on a specimen in which a couple of the middle dorsal rays were broken, and the scales rubbed off, was referred to *Blennius*, from which I subsequently separated it, as it evidently did not belong to that genus. A specimen obtained by Dr. Stimpson, off the coast of Maine, appears to be identical with Dr. Storer's species, notwithstanding the disparity in the number of rays. It has enabled me to recognize its true affinities with the *Lumpenus gracilis* of Reinhardt, near which I had long suspected that it belongs. The Maine specimen is colored like the Massachusetts one, and has a caudal like *L. gracilis*, and only seventy-six dorsal spines, fifty-five anal rays, the first of which is nearly under the twenty-fifth of the dorsal, and in the ventrals there are *three* articulated and one spinous rays. Storer's specimen is said to have, and is figured with eighty-seven dorsal rays ; there are sixty-six anal and two ventral. I cannot but suspect, however, that on account of the poor condition of the specimen, some misapprehension may have resulted.

Leptoblennius gracilis *Gill* ex *St.*

Blennius gracilis *Stuvitz.*
Clinus gracilis *Reinhardt*, Vid. Selsk. Nat. og Math. Afh. vii., 194.
Lumpenus gracilis *Reinhardt. Kr.* Nat. Tid. (3) i., 282.
Lumpenus nebulosus pt. *Nilsson*, Skand. Fauna iv., 195.
Centroblennius nebulosus *Gill*, Cat. 45.

On the authority of Prof. Nilsson, this species was presented in the Catalogue of the Fishes of the Eastern Coast under the name of Fries, but according to Kroyer it is distinct.

LUMPENUS Reinhardt.

Lumpenus Fabricii *Reinhardt.*

Blennius lumpenus *Fab.*, Fauna Gr. sp. 109.
Clinus lumpenus *Reinh.*, Vid. Selsk. Nat. og. Math. Afh. vii., 114.
Lumpenus Fabricii *Reinh.*, Vid. Selsk. Forh. 1832—5, p. cx.
Gunnellus Fabricii *Storer*, Syn. 121.
Hab.—Greenland.

ANISARCHUS Gill.

Anisarchus medius *Gill* ex. *R.*

Clinus medius *Reinh.*, Vid. S. N. og. M. Afh. vii., 114, 121, 194.
Lumpenus medius *Reinh.*, Vid. Selsk., Fohr. 1835—6, p. cx.
Hab.—Greenland.

LEPTOCLINUS Gill.

Ctenodon *Nilsson* (not Swainson.)

Leptoclinus aculeatus *Gill* ex. *R.*

Clinus aculeatus *Reinh.*, Vid. S. N. og. M. Afh. vii., 114, 122.
Lumpenus aculeatus *Reinh.*
Leptoclinus maculatus *Gill*, Cat. 45.
Lumpenus maculatus *Nilsson*, Sk. F. iv., 190.
Hab.—Greenland.

In this case, also, Nilsson was my guide in the identification with *Lumpenus maculatus*, but, as shown by Kroyer, such is undoubtedly erroneous.

STICHÆUS Reinhardt.

Stichæus punctatus *Reinh.* ex. *Fab.*

Blennius punctatus *Fab.*, F. G. No. 110.
Clinus punctatus *Reinh.*, Vid. S. N. og. M. Afh. vii., 114.
Stichæus punctatus *Reinh.*, Vid. Selsk. Fohr. 1832—1836, p. cx.
Hab.—Greenland.

EUMESOGRAMMUS Gill.

Eumesogrammus præcisus *Gill* ex *Kr.*

Clinus præcisus *Kroyer*, Nat. Tid. i., 25, Aug. 1836, (fide Kr.)
Clinus unimaculatus *Reinh.*, Vid. S. N. og. M. Afh. vii., 114, 121, Feb. 1837, (fide Kr.)
Stichæus præcisus *Kroyer*, Nat. Tid. i., 372 ; Voyage en Scand., &c., tab. 20, f. 1, a—f ; Nat. Tid. (3) i., 295, 1862.
Hab.—Greenland.

EUMESOGRAMMUS SUB-BIFURCATUS *Gill* ex *St.*

Pholis sub-bifurcatus *Storer*, Rep. 63; Syn. 118.
Stichæus sub-bifurcatus *Gill*, Cat. 45. (Storer, Putnam, &c.)

Hab.—Massachusetts, Maine, Nova Scotia, &c., and Newfoundland.

Especially distinguished from *E. præcisus* by the absence of the abdominal lines, and the continuance of the median lateral one to the base of the caudal fin.

Notes on SHELLS, with descriptions of new fossil Genera and Species.

BY T. A. CONRAD.

NOETIA, Gray.

N. PONDEROSA, Say, occurs abundantly in the Post-Pliocene of the Southern States, and lives on the southern coast of Florida. Specimens have lately been received from Pensacola, and are in the cabinet of the Academy. It is unknown in the Mioeene, the shell I referred to as a variety being a distinct species.

TURRITELLA, Lam.

T. PRÆCINCTA. Turrited, broad at base; sides straight, a profoundly elevated, thick, angular carina revolves at the summit of each volution, gradually disappearing at the fourth whorl; carina slightly channelled above, and having a single revolving line beneath near its junction with the whorls, which have each three revolving lines, the inferior one most prominent. Length 3⅝ inches; width of body whorl, independent of carina, ¾ inch.

Locality. Dallas Co. ? Alabama. Eocene.

This large species differs from *T. Mortoni* in having a larger and more abruptly elevated carina, larger and fewer revolving striæ, &c. It is allied to *T. rotifera*, Lam. The specimen described was loaned for the purpose by Mr. R. P. Whitfield. Other specimens are in Barnum's Museum, N. Y.

PROTOCARDIA, Beyrich.

P. VIRGINIANA. Cordate, subtriangular, inequilateral, ventricose, thin; radiating lines minute; anterior upper margin very oblique, slightly emarginate, posterior side slightly produced, the margin obliquely truncated; post-umbonal area densely tuberculated on closely arranged striæ; posterior cardinal tooth small, tubercular. Height 1½ inch; length 1 2-5ths inch.

Locality. Pamunkey River, Virginia. Mr. Ruffin.

This species is smaller and proportionally longer than *P. Nicolleti*, with a smaller umbo, &c. This is the third Eocene species of *Protocardia* found in the United States. There are two species in the American Cretaceous rocks. The genus did not survive the Eocene fauna.

ECPHORA 4-COSTATA, Say.

Lister's figure 1059, fig. 2, represents a rare variety of this species, without umbilicus. I found one such specimen. Dillwyn erroneously refers Lister's figure to a variety of *Buccinum scala.* The shell is very peculiar in substance, resembling horn. The umbilicus, though generally enormously large, is sometimes moderate. The range of this species is from New Jersey to South Carolina, inclusive.

FASCIOLARIA, Lam.

F. SUBTENTA. Fusiform; volutions 7; body whorl ventricose, penultimate subangulated, the others angular below the middle, tuberculato-costate; surface rugoso-striate; lines alternate on the spire, irregular on the body whorl, many of them thick and prominent; minute, rugose, longitudinal lines ornament the whorls; outer lip ribbed within, the ribs divided towards the interior; plait on the columella acute, bounded on either side by a furrow. Length 5⅛ inches; width 2¾ inches.

Locality. Natural Well, Dauphin Co., N. C.

FASCIOLARIDÆ?

LIROSOMA, Conrad.

L. curvirostra. Subfusiform; volutions 6; spire prominent; ribs rounded, revolving, six on the sides of the two larger whorls of the spire, and one on the flat upper surface; about 21 on the body whorl with a fine intermediate line; surface of the shell finely wrinkled longitudinally; aperture patulous; base of columella rounded; fold obsolete; beak long and twisted.

Locality. North Carolina?

A larger species than *L. sulcosa*, and differing in having a longer and twisted beak, more prominent and acute spire, and in wanting the longitudinal furrow or coarse lines, &c.

ERYCINELLA, Conrad.

E. ovalis, Conrad. Having obtained several specimens of this Miocene fossil since the description was first published, I find, on comparison with the English shell sent me by S. V. Wood, that it is a distinct species from the latter.

Mr. Stimpson also made the comparison in my presence, and came to the same conclusion. The error, therefore, in the Monograph of the Crag Mollusca is mine.

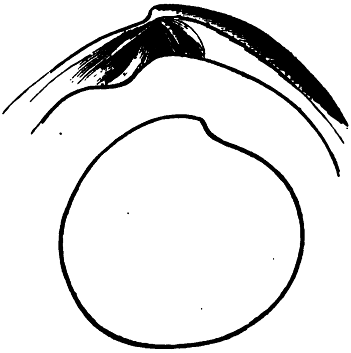
CYPRINIDÆ.

CYPRIMERIA.

Lentiform; hinge of right valve broad, with a bifid oblique cardinal tooth under the apex, and two oblique acute anterior teeth, with an intermediate pit for the reception of the tooth in the opposite valve.

Cytherea excavata, Morton.

Only one valve has been obtained showing the hinge, and the exterior markings, which consist of very fine concentric lines on the umbo and wrinkled lines of growth on the other parts. There is no cartilage pit. Behind the bifid tooth is a slightly raised plate rugoso-striate. The muscular impression unknown. Found at Arneytown, N. J., in Cretaceous marl.



Cyprimeria excavata.

DOSINIOPSIS.

Equivalve, lentiform; hinge with three cardinal teeth in each valve; posterior tooth of right valve bifid; in the left valve a thick rugose lateral tooth fitting into a cavity in the opposite valve; under the apex is a pit or cavity; cartilage plate granulated; pallial sinus deep and angular.

Exteriorly the shells of this genus resemble *Dosinia*; and the pit under the apex and the form of the pallial impression are similar, but the anterior, thick, rugose cardinal tooth, the posterior hinge channel and tooth-like plate, and the muscular impressions ally it most nearly to *Venilia* and *Cyprina*.

Venus lineolatus, Sowerby, has a hinge character nearly allied to, if not identical with, this genus.

D. MEEKII. Short ovate, ventricose, moderately thick, inequilateral; anterior margin regularly rounded; posterior dorsal margin elongated, rounded, very oblique, the extremity subangulated; apex prominent; basal margin profoundly curved; lunule obsolete, or defined by an obscure line; surface without other lines than those of growth. Height $1\frac{7}{8}$ inch; length $1\frac{3}{4}$ inch.

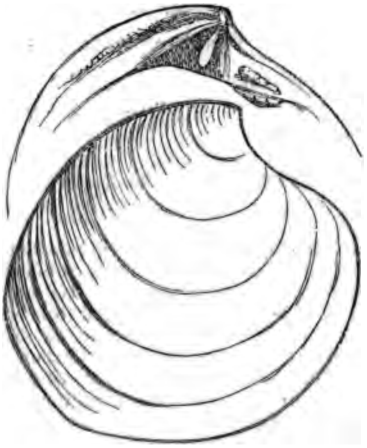
Locality. Six miles east of Washington, D. C. Meek.

Proportionally more elevated and convex than *D.* (*Cytherea*) *lenticularis*, Rogers.

A singular feature of this shell is a tuberculated callus under the anterior cardinal plate, which occurring in 4 valves must be characteristic of the species. It has the appearance of having grown up from the inner surface of the valve and folded over the under side of the hinge plate.

Mr. Meek found this species abundantly in a dark grey quartzose sand, six miles east of Washington, D. C., in company with other new univalves and bivalves. *Cytherea lenticularis*, Rogers, belongs to the genus *Dosiniopsis*, and more closely resembles *Dosinia* exteriorly. Both characterize the oldest portion of the American Eocene which has yet been observed.

This genus, like the preceding, is remarkable for uniting the characters of two families, *Cyprinidæ* and *Veneridæ*, which are obviously distinct in the recent shells.



Dosiniopsis Meekii.

RADIOLITES, Lam.

Subgenus Tamiosoma, Conrad.

R. gregaria, Conrad. Explorations and Surveys for Rail-road route to Pacific, vi. 72, iv. 18. This fossil is characteristic of the Cretaceous formation in California.

October 4th.

Mr. Lea in the Chair.

Eighteen members present.

The following papers were presented for publication:

"On a blind Silurid from Pennsylvania," and "On the Characters of the higher groups of Reptilia squamata, &c." By E. D. Cope.

October 11th.

Dr. Bridges, Vice-President, in the Chair.

Fifteen members present.

October 18th.

Dr. McEuen in the Chair.

Nineteen members present.

The following paper was presented for publication: "Fasti Ornithologiæ." No. 1. By John Cassin.

October 25th.

Dr. Bridges, Vice-President, in the Chair.

Fourteen members present.

On report of the respective committees, the following papers were ordered to be published:

Synopsis of the PLEURONECTOIDS of the Eastern Coast of North America.

BY THEODORE GILL.

In the present brief article, an analytical synopsis distinguishing the genera of east coast *Pleuronectoids*, already named, is submitted, and the different names under which the species have been described are referred to the synonymy of the species to which they are supposed to belong; and, in one case, (*Reinhardtius hippoglossoides*) where the decision of the synonymy would involve the nomenclature and geographical distribution of two widely distinct forms, the synonymy has been quite fully discussed. If the premises taken are correct, the genera herewith enumerated are the only known forms as yet entitled to a place in the Fauna of the East Coast. If, on the other hand, that view against which I have contended is the true one, the genus *Glyptocephalus*, an ally of *Pleuronectes*, must be added, and the name *Reinhardtius hippoglossoides* replaced by another.

Family *SOLEOIDÆ*, Bon.

Subfamily SOLEINÆ, (Bon.)

ACHIRUS, Lac.

Grammichthys *Kaup.*
Trinectus *Raf.*

Achirus lineatus, Cuv.

Pleuronectus achirus *L.*
Pleuronectus lineatus *L.*
Achirus fasciatus *Lac.*
Pleuronectes mollis *Mit.*
Achirus (lineatus) *Cuv.*
Achirus mollis *St.*
Grammichthys lineatus *Kaup.*
Solea achirus *Gthr.*

Subfamily PLAGUSINÆ.

PLAGUSIA, Brown.

Aphoristia *Kaup.*
Glossichthys *Gill.*

Plagusia plagiusa, Gill.

Pleuronectes plagiusa *Linn.*
Plagusia fasciata *Dek.*
Glossichthys plagiusa *Gill.*
Hab.—North and South Carolina.

Family *PLEURONECTOIDÆ*, Bon.

We owe to Cuvier the first natural subdivision of the genus *Pleuronectes*, as restricted by Quensel. That great philosopher distributed the representatives of the genus thus limited, which is equivalent to a family in the modern acceptation of the word, among three subgenera:—*Platessa*, in which the teeth of the jaws are uniserial, trenchant and obtuse, and those of the pharyngeal bones blunt; *Hippoglossus*, in which all the teeth are strong and acute, and *Rhombus*, similar to the latter, but with the dorsal advanced towards the edge of the upper jaw. The species respectively referred to these several groups are evidently closely related, and all possess characters coincident with those assigned by Cuvier, and apparently of greater value. The *Platessæ* have a small oblique mouth in front of the eyes; the *Hippoglossi*, a large one extending below the eye; and in the *Rhombi*, the ventral fins are very broad at their bases, the rays distant, and the fin of the colored side on the ridge of the abdomen. These groups correspond to the subfamilies Pleuronectinæ, Hippoglossinæ and Rhombinæ as now limited, and thus have different elements from the subfamilies of Bonaparte. The natural character of these groups was first destroyed by the reference to the Platessæ of the *Pleuronectes limandoides* of Bloch. This fish was referred by Cuvier to the genus *Hippoglossus*, but was subsequently transferred by all naturalists to the genus *Platessa*, with which it neither agrees in technical characters nor in natural ones. Subsequent modifications of the subgenera of Cuvier rendered them still less natural, and the American species, especially, were grouped little in accordance with their affinities. In the following synopsis of the *Pleuronectoids* of Eastern North America, I have distributed the species in accordance with the Cuvierian ideas.

I. Mouth small, the supramaxillary ending before or under front of eye.. Pleuronectinæ.
  A. Body with scattered ciliated scales. Teeth moveable.. *Euchalarodus.*

AA. Body with well developed scales. Teeth fixed.
  a. Lateral line with no arch in front. Scales regularly imbricated...................................... *Pseudopleuronectes.*
  aa. Lateral line with a semicircular arch in front.
    β. Snout conic; mouth moderately oblique.... *Myzopsetta.*
    ββ. Snout retuse; mouth very oblique.......... *Limanda.*
AAA. Body perfectly smooth.................................. *Liopsetta.*
II. Mouth large, the supramaxillars extending more or less under eye. Ventrals lateral.................................. HIPPOGLOSSINÆ.
  A. Caudal entire and produced behind.
    β. Eyes on the right side.
      Scales ctenoid.. *Hippoglossoides.*
      Scales mostly cycloid................................. *Pomatopsetta.*
    ββ. Eyes sinistral; interorbital area flat............ *Chænopsetta.*
  AA. Caudal emarginated, produced laterally.
    Lateral line straight; dorsal and anal regularly arched.. *Reinhardtius.*
    Lateral line arched in front; dorsal and anal rays elevated at middle of fins................................ *Hippoglossus.*
III. Mouth large. Ventral fin of the dark side inserted on the ridge of the abdomen....................................... RHOMBINÆ.
  a. Ventral fins very broad; dorsal fin with its anterior rays branched.................................. *Lophopsetta.*
  β. Ventral fins narrow; dorsal fin with all rays simple.. *Citharichthys.*

Subfamily PLEURONECTINÆ, Bon.

PSEUDOPLEURONECTES, Blkr.

PSEUDOPLEURONECTES AMERICÁNUS Gill.

Pleuronectes americanus *Walb.* Art. Gen. 113. *Schn.* 150.
Pleuronectes planus *Mitch.*
Flounder, *Schn.* 163.
Platessa plana *Storer.*
Platessa pusilla *Dek.*
Pseudopleuronectes planus *Blkr.*
Hab.—Eastern Coast.

EUCHALARODUS, Gill, n. g.

EUCHALARODUS PUTNAMI, Gill.

D. 55—58. A. 39—40. C. 3. 6. 6. 3. P. 10—11.
Alt.: Long.=1; 2 4-5ths—2⅔.—Cap. 1: 4½—4¼.
Hab.—Salem, Mass.

In a small collection of desired fishes, which I owe to the kindness of my friend, Mr. F. W. Putnam, of Salem, Mass., were two specimens of this undescribed representative of the Pleuronectinæ. The new species is generically distinct from any representative of the family hitherto found, not only of the eastern American seas, but from any yet known, although it shares some characters with a Russian fish, the *Platessa dwinensis* of Liljeborg,* (*Pleuronectes dvinensis* Gthr.

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* Bidrag til Norra Rysslands och Norriges fauna, &c., af *Wilh. Liljeborg* in Kongl. Vetenskaps-Akademiens Handlingar, för ar 1850, (Stockholm, 1851,) p. 306, (256,) pl. xx., figs. 1. 2.

"Maxilla utraque serie simplici dentium, forma iisdem *Pl. vulgaris* auct. *similium, contiguorum apiceque æqualiter truncatorum.*——Spina analis adest.——subtus albida, lævis." The italicized portion is repeated from Liljeborg's diagnosis. The relations of *Pl. dwinensis*, consequently, appear to be with the true *Pleuronectes.*

MYZOPSETTA, Gill.

MYZOPSETTA FERRUGINEA, Gill.

Platessa ferruginea *St.* Rep. 41, pl. 2.
Pleuronectes ferrugineus *Gthr.*, Cat. iv., 447.
Hab.—Massachusetts to New York.

LIMANDA, Gottsche.

LIMANDA ROSTRATA, Gill.

Platessa rostrata *H. R. St.*, Boston Journ. N. H. v., 268.
Myzopsetta rostrata *Gill*, Cat. 51.

This species, referred with doubt to *Myzopsetta* in the "Catalogue of the Fishes of the Eastern Coast," belongs probably to *Limanda*.

Hab.—Labrador.

LIOPSETTA, Gill.

This genus is proposed for the reception of the *Platessa glabra* of Storer, well distinguished by its form and details of structure, as well as its "perfectly smooth body," an almost anomalous character in the group of genera to which it belongs.

LIOPSETTA GLABRA, *Gill.*

Platessa glabra *St.*, Boston Proc. i., 130; *ib.* Mem. Am. Ac. viii., 393, pl. 31, f. 1.
Hab.—Massachusetts.

Subfamily *HIPPOGLOSSINÆ* Gill.

HIPPOGLOSSOIDES, Gottsche.

Citharus *Reinhardt*.
Drepanopsetta *Gill.*

Misled by the ambiguity of the description by Fabricius of the lateral line of *Pleuronectes platessoides*,—"Linea lateralis humilior, recta medietatem oculorum spectat, *ventriculum tamen arcu ambiens* angulo aperturæ branchialis summo terminata,"—I proposed for it the generic designation *Drepanopsetta*. That species, however, possessing, like *Hippoglossoides limandoides*, a straight lateral line, and otherwise agreeing so far as known, *Drepanopsetta* must be considered as a mere synonyme of the latter.

HIPPOGLOSSOIDES PLATESSOIDES Gill.

Pleuronectes platessoides *Fabr.*, F. G. 164.
Platessa platessoides *St.*, Syn.
Citharus platessoides *Reinh.*, *Kr.*
Drepanopsetta platessoides *Gill*, Cat.
Hab.—Greenland and Newfoundland, (Gill.)

POMATOPSETTA Gill.

POMATOPSETTA DENTATA Gill

Platessa dentata *Storer*, Rep.
Hippoglossoides dentatus *Gill*, *Günther*.

This species has been erroneously identified with the *Pleuronectes dentatus* of Mitchill, who described under that name a species of *Chænopsetta*, distinct from the one so named by Linnæus. I propose, however, to retain as its name *Pomatopsetta dentata*, since the *Pleuronectes dentatus* of Mitchill belongs to a widely different genus.

This is stated by Dekay to be "the *summer flounder*," and to be "extremely common in the markets of New York." I doubt whether it inhabits the waters near the city. The specimens brought to the New York market are caught "down east," according to the fishermen. Dekay's description is evidently copied from Storer; erroneous proportions assigned by the latter being reproduced, and no figure is given.

CHÆNOPSETTA Gill.

CHÆNOPSETTA OCELLARIS Gill.

Pleuronectes dentatus *Mitch.*, Trans. t. 390, (not L.)
Rhombus aquosus *St.* (not *Pl. aquosus* Mitch.).)
Platessa oblonga *Dekay.*
Platessa ocellaris *Dekay.*
Chænopsetta oblonga *Gill.*
Pseudorhombus oblongus *Gthr.*, iv. 426.
" ocellaris *Gthr.*, iv. 430.
Monst. Pleuronectes melanogaster *Mitch.*

Hab.—Maine to North Carolina.

The verification on six individuals of the number of rays furnished the following results:

1.	Beesley's Point, N. J.	D. 88.	A. 66.
2.	New York.	89.	66.
3.	Norfolk, Va.	91.	66.
4.	Beesley's Point.	91.	67.
5.	Old Point, Va.	92.	70.
6.	Beesley's Point	94.	70.

The correctness of Günther's very wide separation of the *Platessa oblonga* and *P. ocellaris* of Dekay, after their union by his successors and countrymen, is, therefore, not evident.

CHÆNOPSETTA DENTATA Gill.

Pleuronectes dentatus *L.*, i. 458.
Pseudorhombus dentatus *Gthr.*, iv. 425.

Hab.—Charleston, S. C., Gordon, Girard.

CHÆNOPSETTA OBLONGA Gill.

Pleuronectes oblonga *Mitch.*, Trans. i. 391.
Platessa quadrocellata *Storer*, Boston Pr. ii., 242, 1847. Mem. A. A. S. viii. 397, pl. 31, f. 3.

Mitchill well describes the coloration. "The uniformity of color is interrupted by *four dark spots* on the back, two on each side of the lateral line. *One* of the two on each side is about *midway of the length*, and the *other near the tail.* The former are about *three-quarters of an inch in diameter* [in a specimen 15 × 6]; the latter not so considerable." This description, therefore, cannot be referrible to a variety of the common species.

The radial formula of Mitchill, (D. 79. A. 59), is not applicable to this *Chænopsetta*, nor *C. ocellaris*, and is probably either the result of a typographical error, or carelessness in enumeration. The *Chænopsetta dentata* exhibits no trace of spots.

REINHARDTIUS Gill, 1860.

Platysomatichthys *Blkr.*, 1862.

REINHARDTIUS HIPPOGLOSSOIDES Gill.

Pleuronectes cynoglossus *Fab.*, F. G. 163, sp. 118, 1780.
" hippoglossoides *Walb.*, Art. Gen. 115, 1782.
" pinguis *Fab.*, 1821.

Hippoglossus pinguis *Reinh.*
Reinhardtius hippoglossoides *Gill*, Cat. 50, 1860.
Platysomatichthys pinguis *Blkr.*, 1862.
Hippoglossus grœnlandicus *Gthr.*, Cat. iv. 404.

This species had by common consent been identified with the *Pleuronectes cynoglossus* of the Fauna Grœnlandica—afterwards named by Walbaum *P. hippoglossoides* and by Fabricius *P. pinguis*—until the year 1862. In that year, Dr. Günther* contended that the "*Pleuronectes cynoglossus*, Fabr. Faun. Grœnl. p. 163, or *Pl. pinguis*, Fabr. Vidensk, Selsks. Naturv. Math. Afhandl. i. p. 43, tab. 2, f. 1, is probably identical with *Pl. cynoglossus* Gronov. and Linn., as the only difference of any importance appears to be that the Greenland fish is said to have 72—74 rays in the anal fin. It is evident, however, from a single glance at the figure, that it is generically different from *Hippoglossus*."

The following characters are the most distinctive respectively assigned to the *Pleuronectes cynoglossus* by Fabricius, and the species of the same name by Günther. It is necessary, however, to first premise that the true *Hippoglossus vulgaris*, as acknowledged by Reinhardt, &c., is first described, after which follows the description of "*P. cynoglossus*," Fab., which is said to be allied to the *P. Hippoglossus*, but to be smaller and more oblong.

PLEURONECTES CYNOGLOSSUS Fab.	PL. CYNOGLOSSUS L., Gthr.
"D. 96. P. 14. V. 6. A. 72. "Vix 26 unc. longitudinem et 8 unc. latitudinem superanus." Height : Length = 1 : $3\frac{1}{4}$.	"D. 102—117. A. 90—102." P. (10) 11—12. V. 7. Height : Length = 1 : 3—$2\frac{7}{8}$.
"Utraque maxilla dentata, *dentibus curvis, acutis*† *rarioribus tamen ac in hippoglosso*, &c. "† Hoc nota *differre præsertim* videtur *a cynoglosso Gronovii* in systemate Linneano citato, cui tribuuntur dentes obtusi et *cauda subrotunda*, quod *non* ita se habet in *pisce grœnlandico :* hæsito igitur, an idem, quod musei gronoviani possessor determinare valet."	"Upper Jaw with a series of about twenty closely-set, *truncated, incisor-like teeth on the blind side.*"
"Cauda subintegra. †	Caudal unusually convex or rounded behind.
"Linea lateralis corpori concolor a cervice ad caudam *oblique* progreditur."	"Lateral line straight, without curve " or noticeable obliquity.
"Cetera ut in præcedente (*Hippoglossus*).	

As negative evidence, the absence, so far as known, of the true *Pleuronectes* or *Glyptocephalus cynoglossus* in the Greenland seas, whose Ichthyology is so well known, is one of the strongest, especially as Fabricius states that his species is comparatively abundant and readily caught.

Equally explicit also is the description of the same species by Fabricius under the new name of *Pleuronectes pinguis*, in the Transactions of the Royal Danish Academy.‡

That description is indeed the amplification of the one in the "Fauna Grœnlandica." The fins are described, the caudal as emarginated,§ the rays

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* Gthr. Cat. iv. 450, under Pleuronectes cynoglossus.

† In *P. hippoglossus*, "cauda fere integra," in *P. platessoides* (*Hippoglossoides platessoides*) "magna, lata, *parum rotundata*."

‡ Det kongelige Danske Viderskabernes Selskabs. Nat. og Math. Afh. i. (1824,) p. 43, tab. 2. f. 1.

§ *Sporfinnen* er bred, smalest ved Roden og bredest i yderste Rand, hvor den *ligesom rundes ind ad.*

D. 96—98, A. 72—74, P. 14—15, and the proportions and dentition are made known in essentially the same terms. Furthermore, the scales are said to be very small, and imbedded in the skin, which appears smooth and slimy to the touch;* one of the eyes is nearly on the crown of the head,† and the branchial arches have large and robust rakers, each with eight pectinations, themselves divided at the tip.‡

As to the figure, it cannot assist identification, being a worthless caricature, and, like that of the *Hippoglossoides platessoides*, representing a small mouth. It might equally well serve as the representation of any Pleuronectoid, and is as unlike the *Glyptocephalus cynoglossus* as any other species.

From these remarks, it will be evident that I feel compelled to agree with the several excellent naturalists who have identified the Fabrician fish with a Pleuronectoid closely related to *Hippoglossus*, since every character which distinguishes it from *Glyptocephalus cynoglossus* is shared with the species under consideration.

HIPPOGLOSSUS Cuv.

Hippoglossus americanus Gill.

Pleuronectes hippoglossus *Mit.*
Hippoglossus vulgaris *Storer.*

This species is distinguished from its European congener, with which it has hitherto been confounded, by all but Günther, by its higher body, more oblique mouth, &c. It is not clear why Dr. Günther should consider it, even with doubt, as identical with *Reinhardtius hippoglossoides.* The figure given by Dekay represents the form and fins of a *Hippoglossus*, and the lateral line is expressly said to be "arched over the pectorals." The species is, therefore, a typical *Hippoglossus.*

Subfamily RHOMBINÆ, Bon.

LOPHOPSETTA Gill.

Lophopsetta maculata Gill.

Pleuronectes maculatus *Mit.* Rep. 1814, p. 9.
" aquosus *Mit.* Phil. Tr. i. 389.
Rhombus aquosus *Cuv.* R. A.

Hab.—Eastern coast generally.

CITHARICHTHYS Blkr.

Citharichthys microstomus Gill.

D. 31. A. 58. C. 4. 6. 5. 3.

Scales $42\frac{10}{14}$.

Hab.—New Jersey to North Carolina.

Descriptions of new Genera and species of Eastern American PLEURONECTOIDS.

In a collection of rare fishes recently received through the kindness of Mr. F. W. Putnam and from the Salem Institute, was a fine new generic type of Pleuronectoids, distinguished by some remarkable characters. To make this known, and also especially a new species of *Citharichthys*, obtained by Prof.

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* Overfladen har vel paa begge Sider mange smaa Skjal; men de sidde saa fast i Huden, at de neppe lade sig Skjalue derfra, saa den er glat at föle paa fuld af Sliim.

† Ojnene sidde begge paa höjre Side, det ene af dem næsten paa Hovedets Isse.

‡ Gjællerne ere 4 med store og stærke hvide Klinger og mörkeröde Fryndser; bag til har hver Klinge 8 Kamtakker, hvilke atter for Enden have hver 2 smaa skarpe Tænder.

Baird and Dr. Stimpson at Beesley's Point, and by the latter and the author at Beaufort, North Carolina, the present article is submitted.

EUCHALARODUS,* Gill.

Body oblong, ovate-rhombic, with the caudal peduncle moderate and uniform.

Scales minute, distant, immersed, each one on the colored side with several slender teeth behind directed outwards; on the light side smooth or uniciliate.

Lateral line straight, simple, continuous through a series of short tubes, channelled along their posterior half.

Head moderate, rhombic, depressed above the eye, with the snout nearly rectilinear and the rostral area rhombic; covered with minute scattered scales extending along the interorbital area, and with an osseous ridge below the upper eye, and continued from its hinder angle backwards, where it is expanded, and separated from an oblique bony tubercule on the scapula. *Eyes* moderate, approximated, even, chiefly in the anterior third of the head. *Nostrils* of the dark side even longitudinally, the anterior next to the border of the snout; the posterior between orbits in front; of the left side, on the left side of the ridge, approximated; the hinder close in front of the dorsal fin at its inner angle; anterior nostrils tabular and nearly blind, minutely perforated near the end; posterior transversely fissured, with lips. *Opercula* well developed.

Mouth moderately small, with the cleft oblique (c. 45°) in front of eye; the jaws of the respective sides nearly equal; the lower scarcely prominent, and with a very obtuse, rounded chin.

Lips moderate and simple; the latter attached by a frœnum at the left side of the symphisis.

Tongue slender, but well developed and free.

Teeth uniserial, in an imperfect row on the dark side, moderate, *moveable, reclining inwards, compressed, capitate or constricted near the apex*, and with the apex itself blunt and emarginate, especially towards the symphisis; palate smooth.

Branchial apertures free below, closed above the operculum.

Branchiostegal rays seven, exceptionally six.

Dorsal fin with its rays simple, in moderate number; its origin above the upper eye, rapidly increasing, and with its rays converging towards the posterior third.

Anal fin with its middle rays highest, but directed obliquely forwards, and with no true spine in front.

Caudal convex behind.

Pectoral fins moderate, obliquely rounded behind.

Ventral subbrachial, normally developed.

The *interior pharyngeal* bones are *united, oblong, triangular*, with the sides rectilinear; the posterior margin *broadly emarginate*, (without sinus at the junction) *bent upwards* and trenchant; behind and beneath sloping forwards, and with a wide *trihedral enlargement* expanded downwards below at the middle. The teeth are blunt, paved, and on all the upper surface, except the deflected posterior marginal area. The lower pharyngeals are oblique, the middle largest; the first and second with two rows of molar teeth; the third with one.

The branchial arches are provided on their external surfaces with soft, compressed, unarmed, subunguiform rakers, decreasing from the first to the fourth, oblong on the first, very short on the fourth, which alone has rudimentary rakers on the internal surface.

Such is the combination of characters, which distinguishes this remarkable newly-discovered type among the genera of Pleuronectoids. From the American genera *Pseudopleuronectes*, Blkr., *Liopsetta*, Gill, *Myzopsetta*, Gill, and *Limanda*, Gottsche, it is at least distinguished by its squamation, oculo-scapular ridge, nostrils, dentition and structure of the dorsal and anal fins. It is most nearly related to *Pleuronectes*,* with which it agrees in the free tongue, but the more perfect union and the triangular form of the wholly united lower pharyngeal bones, the want of an anal spine, and above all the moveable teeth and scarcely perforate anterior nasal tubes will especially distinguish it, not only from that genus, but from any other known one. So anomalous indeed are the characters of dentition and nostrils, that only after I had felt each tooth could I be convinced that they were really normally moveable, and that the condition was not the effect of disease, an idea which, improbable as it was, occurred to me. The remaining genera of the subfamily of Pleuronectinæ—*Platichthys*, Grd., *Parophrys*, Grd., *Lepidopsetta*, Gill, *Glyptocephalus*, Gottsche, *Microstomus*, Gottsche,† *Pleuronichthys*, Grd., *Hypsopsetta*, Gill, *Heteroprosopon*, Blkr., and *Clidoderma*, Blkr.—are equally or still more distinct than those already mentioned.‡

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* Εὖ, well; χαλαρός, loose; ὀδούς, tooth.

EUCHALARODUS PUTNAMI, Gill.

The height of the body enters between $2\frac{4}{5}$ and $2\frac{3}{8}$ times in the extreme length. The head enters about $4\frac{1}{3}$—$4\frac{1}{2}$ times in the same, and is not much longer than the caudal fin. There are about 19—20 teeth in the upper jaw, on the white side, and 9 or 10 on the dark; in the lower 11 to 13 on the white, and about 5 on the dark side. The height of the dorsal fin, at its highest portion, which is at or near the thirty-second ray, is little less than a seventh of the total length; the longest anal rays, from the thirteenth to fifteenth, equal or excel those of the dorsal. The pectoral fin enters about $6\frac{1}{4}$—$6\frac{1}{2}$ times in the length, and attains to the vertical from the twenty-third to twenty-seventh dorsal ray and eighth or ninth anal one. The ventral fin is inserted with its axil at the vertical of the upper axil of the pectoral, and reaches to the second or third ray of the anal; its length enters $9\frac{1}{3}$—$9\frac{3}{4}$ times in the total.

D. 55—58. A. 39—40. C. 3. 6. 6. 3. P. (3—4. 5. 2.) 10—11 V. 6.

The color is dark brown: sometimes (in the younger) the vertical fins are clouded with darker.

Two specimens, presented by F. W. Putnam, Esq., the Secretary of the Essex Institute, of Salem, Mass., have furnished the material for this description. Both were caught, with others, by C. A. Putnam, Esq., in the harbor of Salem, in the month of January, 1858. To the able ichthyologist to whom we are indebted for our knowledge of the species, we dedicate it in token of friendly and scientific appreciation.

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* Pleuronectes, (Art.) *Blkr.* Verslagen en Mededeelingen der koninklijke Akademie von Wetenschappen (Amsterdam) xiii, 1862, 426—427.

† Microstomus, *Gottsche*, 1835=Cynicoglossus, *Bon*, Fauna Italica Fasc., xix, 1837, (sub *Plat. passer*)=Cynoglossa, *Bon*, 1846, &c. *Microstomus* is perhaps sufficiently distinct from *Microstoma*; if not, can *Cynicoglossus* be used? Bonaparte, in his enumeration of the subgenera of *Pleuronectes*, after the definition of *Platessa*, gave that of *Cynicoglossus*. "Secondo è *Cynicoglossus* nob. che come il *Pl. cynoglossus* L. ha la linea laterale retta, la bocca piccola, li denti come quello di sopra [*Platessa*] ma la *mascelle uguali*, con *labbra turgide*, e *l'ano senza spina*." Bonaparte has simply followed Nilsson in the erroneous identification of *Pleuronectes microcephalus* with *Pl. cynoglossus*, L. As the definition of his genus does not, however, apply to the latter and does to the former, it may perhaps be connected with it, notwithstanding the specific mention of the type.

I am aware that an anal spine has been recently denied to *Glyptocephalus cynoglossus*, but it is quite distinct in the specimen seen by me, and its presence has been admitted by other naturalists. On the other hand, a prominent spine has been attributed in one place to *Microstomus*, and denied in another; the latter view is sustained by naturalists generally. I am also aware that the lateral line has been said to be strongly curved, but a very slight curvature only seems to be evident in nature.

‡ Dr. Günther has referred to the group of narrow-mouthed Pleuronectoids with "the upper eye not in advance of the lower," four very well marked generic types—*Psammodiscus*, *Ammotretis*, *Rhombosolea*, and *Peltoramphus*—which evidently have no affinity with *Euchalarodus*. Their systematic position even is for me doubtful, and some of them at least—especially *Peltorhamphus*—appear to belong to the family of Soleoidæ. As however the form, the distinction or not externally of the opercular bones, the structure of the mouth, the development of the branchial apertures, &c., have not been made known with sufficient precision, no definite opinion can be formed.

The next species appears to belong to a genus already established by Dr. P. Von Bleeker, but differs very decidedly from the known species.

CITHARICHTHYS *Blkr.*, *Gthr.*

CITHARICHTHYS MICROSTOMUS, Gill.

The height of the body enters about 2⅔ times (·36—·37) in the extreme length; that of the caudal peduncle about eleven times. The head forms a fifth of the length, is rather abbreviated, scarcely sinuous above the eyes, blunt at the snout, which scarcely exceeds a seventh of the head's length, and the rostral area is rhombic, and not higher than long. The eyes are even; the longitudinal diameter contained about 3⅗ times (.05½ in the head's length. The mouth is rather small, the length of the upper jaw only equalling a quarter of the length, and that of the lower two-fifths of the head's length. The teeth are very small, and close together; larger in front. The dorsal commences above the front of the orbit, and is highest, and convergent near the fortieth ray, which equals about the tenth of the total length; the anal is highest at about the twenty-fifth ray, and is high or even higher than the dorsal. The caudal is rounded behind, and forms about a sixth of the length. The pectoral fins are unequally developed, that of the dark side being prolonged, and contained only 6⅔ times in the total length, while that of the white side only equals a tenth of the same; the rays are all simple. The ventral fins are also unequally developed, the right being on the abdominal ridge at its origin, rather in advance of the opercular margin, and with its longest rays contained about fourteen times in the total length; stretched backwards, it extends to the second anal ray; the fin on the white side is more advanced, wider, and its rays longer, contained less than twelve times in the length, and extends backward to nearly the third anal ray.

D. 81. A. 58. C. 4. 6. 5. 3. P. 10. V. 6.

The scales are large, angular behind, covered with smaller ones, especially near the point of junction of contiguous ones, where alone they are developed on the blind side; the scales of the eyed side are mostly minutely ciliated behind, unarmed however near the lateral line, the scales of which last are quadrate and mostly covered; the scales of the blind side are less angular behind and unarmed. The lateral line runs through about forty-two scales, while of longitudinal rows there are ten above and fourteen below the lateral line.

The color is uniform reddish brown.

A single specimen, little more than three inches long, was first obtained by Prof. Baird at Beesley's Point. It is especially distinguished from its California relative, *O. sordida*, by the short snout, small mouth and large scales; *O. sordida* having about fifty-eight scales pierced by the lateral line, and eighteen rows above the lateral line. Notwithstanding this great disparity in the size of the scales and mouth, *C. microstomus* appears to agree in most respects with the Californian fish, as well as generically with *Citharichthys spilopterus* of Günther, aspecies inhabiting the Gulf of Mexico. As the name *Citharichthys* was introduced a short time before that of *Orthopsetta*, proposed for the *Psettichthys sordidus*, and was framed for a species related to that type, that name must be adopted if the *O. sordida* is not regarded as generically distinct.

I may here remark that, although I have referred the *Platessa quadrocularis* of Storer to the genus *Chænopsetta*, (*C. oblonga*), it is possible that it may not truly belong to that genus, as the dorsal and anal fins are represented as increasing backwards till near their ends, and the anterior dorsal rays are free at their ends; but as the species agrees so closely in other external characters, I feel compelled to retain it in that genus for the present at least.

In this connection, I may also mention a species found at Pensacola, which exhibits several characters in common with the species referred to, but represents a distinct genus closely related to *Chænopsetta*, *Paralichthys* and *Pseudorhombus*; the naso-dorsal side of the rhombic outline is very convex; the supraocular region depressed; the interorbial area formed by a narrow, scaleless ridge; the caudal peduncle short; the scales ctenoid, and the dorsal and anal fins respectively highest, and convergent far behind and at nearly the same vertical. The species has a height of little less less than half the extreme length; the head almost a fourth, and the caudal almost a fifth. The first fin rays are the longest and filiform, progressively increasing, and the fin itself commences at a vertical between the orbit and pupil. The rays of the dorsal (70) converge towards the fiftieth; those of the anal (56) towards the thirtieth.

The color is reddish brown, with four ocellated spots larger than the eye; the first above the longer declining portion of the *falciform* arch of the lateral line; the *three posterior forming* the angles of a *triangle;* the anterior two midway between the snout and caudal margin, and the posterior on the lateral line. It may be named *Ancylopsetta quadrocellatus.*

On the Characters of the higher Groups of REPTILIA SQUAMATA—and especially of the DIPLOGLOSSA.

BY E. D. COPE.

Since it is only by an attentive consideration of the peculiarities of organized beings that their relationships in time present and past can be determined, the more complete that examination the more certain will our conclusions be. In the course of preparation of systematic work, the great- need of well established bases is often felt, and nowhere more urgently than among the Reptiles. The following abstract, presenting some new views in this department, have been taken from my MSS., as exhibiting some of the stronger points among the multitudinous variations of the reptilian skeleton.

Prof. Johannes Müller* has given us the best characters for distinguishing the Ophidia and Lacertilia, viz.:—The former having the ali- and orbito-sphenoid regions osseous—the latter membranous; there being one suspensorium for the quadratum in the first, two in the second. It is true he says Acontias forms an exception, having but one suspensorium, but I have seen the second in a specimen prepared by Herr Will, of Munich, and Prof. Peters showed it to me in a Berlin specimen. Anelytrops, a genus nearly allied to Typhlosaurus, possesses both, well developed. Aniella, however, appears to constitute a real exception to the rule, having but one suspensorium, thus resembling the Ophiosaurii or Amphisbænia: it resembles the latter so in its elongate temporal, continuous with the parietal, the downward prolongation of the latter bone and its close union with the occipital sclerotome, as to connect them closely with the Lacertilia. The true hiatus in the series of Squamata is, in my opinion, to be found between the Ophiosauri and Tortricina. The characters of the skeleton remaining up to the present time, by which Lacertilia and Ophidia may be distinguished, are as follows:

Lacertilia.	Ophidia.
Continuity of the parietal and sphenoid walls interrupted.	Continuity of parietal and sphenoid walls complete.
Rami of the mandible united by suture.	Rami united by ligament.

From the centre of multiplicity of forms of typical Lacertilia, we can pursue three series—one toward the serpents by Amphisbænia, one to the partially degraded type of the Geccos, and lastly through the highest or acrodont series, to Chamæleo on the one hand and Hatteria on the other.

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* Tiedemann and Treviranus Zeitschr. f. Physiologie, iv. p. 233.

In the first case the prolonged development of the superior temporal is followed by a decurving of the parietal border, the closer attachment of the occipital sclerotome, and shortening of the squamosal and mastoid. Finally, the temporal, with the pieces adjoining anteriorly, begin to restrict a foramen ovale, the orbito-sphenoid is developed, and the articular and angular pieces of the mandible are represented by but one piece: the columella disappears. In the last direction, the temporal is not elongate, nor is there any tendency toward a more complete closure of the cranial cavity. The inferior or ? petrous wing of the temporal is directed inwards instead of forwards; the parietal fontanelle does not diminish, and the premaxillary bone is seen to form a regularly decreasing series. The mesosternum and columella diminish in length and disappear, and the splenial appears smaller and smaller to extinction. The subarticular strengthens the inner rather than the outer wall of the mandible, and the external direction of the coronoid is reversed. The type of Hatteria doubles the premaxillary, and exhibits the vertebræ amphicœlian.

In approaching the Geccos, the bones of the palate are seen to be thinner and more expanded, and the articular piece of the mandible is lost. In the full type the ossification is of the lightest description, and the fascial and basement membranes often present incomplete deposits of bony tissue; thus the parietal and sternal fontanelles disappear. The parietals are not, as usual, united, and there is a dimunition (in Uroplates nearly obliteration), of the median or basilar segment of the occipital condyle. There is a temporal ala peculiar to this suborder.

The following is a synopsis of the prevailing characters of the suborders:*

ACRODONTA.

Shanks of teeth compressed, most always between two alveolar walls.
Coronoid bone produced posteriorly, on outside of ramus.
Articular present separate from angular. Splenial reduced, more frequently wanting.
Subarticular small on outer, much prolonged on inner face of ramus.
Groove from splenial to mental foramina not closed over Meckel's cartilage.
Prémaxillary nearly always separated from vomer by maxillaries.
Pterygoids not touching body of sphenoid.
Frontal not arching over the olfactory lobes.
Parietal single, receiving the gomphosis of loosely attached occipital segment internally.
Temporal with longitudinal wing only; superior plate not produced beyond the arched body.
Orbitosphenoid wanting.
Suspensoria two, arches complete.
Rhiptoglossa and *Pachyglossa.*

NYCTISAURA.

Shanks of teeth cylindrical, attached to the inner side of an alveolar wall.
Coronoid bone produced anteriorly and posteriorly.
Articular wanting.
Subarticular largely developed exteriorly, not interiorly.
Splenial elongate; Meckel's cartilage covered between the splenial and mental foramina.
Premaxillary broad, in contact with vomer.

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* Not a few of the characters here noted are pointed out in special cases in Stannius' most excellent Zootomie der Amphibien.

Pterygoids not touching sphenoid.
Frontal arching under olfactory lobes.
Parietal double; attachment of occipital segment very open; gomphosis internal.
Temporal with anterior vertico-oblique wing; superior plate produced beyond arched body, forming abutment for columella.
Orbitosphenoid wanting. Arches incomplete. Suspensoria two.
Vertebræ usually ampicœlian.
Tongue papillose.
Nyctisaura.

PLEURODONTA.

Shanks of teeth cylindrical, attached to inner side of one alveolar wall.
Coronoid bone produced anteriorly, not posteriorly.
Articular, when present, separate from angular, (except in one tribe.)
Subarticular little developed on inner, usually much on outer face of ramus.
Groove for Meckel's cartilage nearly always more or less completely closed.
Splenial nearly always elongate.
Premaxillary in contact with vomers, (with two or three exceptions.)
Pterygoids not touching sphenoid.
Parietal single, receiving gomphosis of the usually slightly attached occipital internally.
Temporal with inferior longitudinal wing only, columella abutting on parietal or incomplete. Suspensoria nearly always two.
Orbitosphenoid wanting; vertebræ procœlian.
Iguania, *Diploglossa*, *Thecaglossa*, *Leptoglossa*, *Typhlophthalmi.*

OPHIOSAURI.

Coronoid bone little developed externally, covering articular internally.
Articular united with angular.
Subarticular little visible externally; elongate internally.
Splenial small; Meckel's cartilage covered on the inner side.
Premaxillary well developed, in contact with vomer.
Pterygoids in close contact with sphenoid.
Frontal under-arching olfactory lobes.
Orbitosphenoid present.
Parietal single, with a close articulation to occipital by external gomphosis.
Temporal without wing, continuous with parietal. No columella.
Arches wanting. Suspensorium, one.
Vertebræ procœlian; tongue scaly.
Amphisbœnia.

The characters of the tribes and the families embraced by them are as follows:

ACRODONTA.

RHIPTOGLOSSA.

Parietal arch elevated, formed of squamosal and parietal; latter not extending to mastoid.
Vertebræ procœlian.
Columella wanting.
Clavicle and mesosternum wanting. Xiphisternal without fontanelle.
No angular process of mandible. Splenial none.
Tongue papillose; terminal portion projectile on glosso-hyoideum.
Toes short, opposable in two and three. Chamæleontidæ.

PACHYGLOSSA.

Parietal arch not elevated, composed of mastoid and parietal in contact.
Columella present, (sometimes very short.)

Clavicle proximally simple; mesosternum anchor-shaped. Xiphisternum with two, sometimes one fontanelle.
Mandible with angular process.
Tongue papillose, simple.
Toes not opposable, all directed forwards. Agamidæ, Hatteriidæ.

PLEURODONTA.

Iguania.

Temporal bone superior plate not developed beyond arched body.
Frontal not under-arching olfactory lobes.
Arches complete; not covered by dermoössification.
Articular and angular separate. Dentary produced posteriorly, not covering coronoid. Meckel's cartilage wholly or in part covered.
Premaxillary single. Suspensoria two.
Clavicle with simple proximal ends.*
Mesosternum anchor-shaped
Tongue papillose, simple. Anolidæ, Iguanidæ.

Diploglossa.

Temporal bone superior plate developed beyond arched body.
Frontal not under-arching olfactory lobe.
Arches complete, temporal fossa covered by dermoössification.
Articular and angular separate.
Dentale not produced far posteriorly. Meckel's cartilage covered.
Premaxillary single. Suspensoria two.
Clavicle with simple proximal ends.
Mesosternum cruciform or rarely simple. No Xiphisternal fontanelle.
Tongue papillose, sheathed at tip. Supranasal plates numerous.
Anguidæ, Gerrhonotidæ, Helodermidæ.

Thecaglossa.

Temporal bone superior plate developed beyond arched body.
Frontal under-arching olfactory lobes.
Arches not complete; fossa not covered by dermoössification.
Articular and angular separate.
Dentary short, not developed posteriorly. Meckel's cartilage exposed in its groove.
Premaxillary single. Suspensoria two.
Clavicle with simple proximal end.
Mesosternum anchor-shaped.
Tongue smooth, sheathed at base. Varanidæ.

Leptoglossa.

Temporal bone superior plate developed beyond arched body.
Frontal with a larger or smaller ridge on each side of olfactory lobes; no arch.
Lateral arches complete.
Articular and angular separate.
Dentary, lower posterior process often short, often long. Groove for Meckel's cartilage mostly overarched. Suspensoria two.
Premaxillary single or double, without exterior marginal foramen.
Clavicles proximally much dilated, usually perforate or enclosing a foramen.
Mesosternum cruciform; not more than one pair of supranasal plates.
Tongue squamous or obliquely plicate.

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* The transverse limb of the mesosternum, extending to the angle of the clavicle, gives an appearance in some of the Basiliscinæ of a proximal foramen.

α Premaxillary simple.	β Premaxillary double.
Teidæ.	Scincidæ.
Lacertidæ.	Sepsidæ.
Chalcididæ.	
Ecpleopidæ.	

TYPHLOPHTHALMI.

Temporal bone superior plate elongate.
Arches incomplete or wanting.
Articular and angular confluent. Suspensoria one or two.
Dentary, inferior process elongate.
Premaxillary single or double.
Clavicles very slender, transverse rudimentary or wanting.
Mesosternum and other sternal pieces wanting.
Tongue squamous or papillose, simple.—Anelytropidæ, Acontiidæ, Aniellidæ.

Of the families here proposed or adopted, the Anolidæ deserves first mention. Its peculiarities are—want of articular bone; absence of xiphisternal fontanelle; presence of abdominal ribs; in these points agreeing with the Nyctisaura or Gecconidæ, and differing from the mass of the Iguanidæ. Still, among the latter Polychrus forms a close connection, wanting the xiphisternal fontanelle, and having the abdominal ribs.

Anguidæ.—This family I have constructed from fragments of the old Zonuridæ and Scincidæ; agreeing with Peters in referring the Old World representatives of the former to the Lacertidæ, and those of the New to the neighborhood of Heloderma. From the Scincidæ I have taken the New World Diploglossinæ, finding them possessed of the same peculiar characters which associate the Pseudopus with Gerrhonotus and Heloderma. The families represented by these types differ as follows. None of them have the dilated maxillary laminæ of the Scincidæ:

A foramen (often large) from nasal meatus to palate on each side of premaxillary. Internasal plate large, transverse. Two or more pairs of supranasals.[*] Head shielded behind. Mesosternum cruciform... Anguidæ.
No premaxillary foramen. Two or more pairs of supranasals. Internasal plate small or wanting. Head scaled behind. Mesosternum cruciform.............. Gerrhonotidæ.
No premaxillary foramen. Head tubercularly scaled. Mesosternum simple.................... .... Helodermidæ.

There are four sub-groups among the genera of Anguidæ, viz.: Opheosaurinæ, with the anterior limb of the mesosternum very short or wanting; the dorsal scales in cross rows and a lateral fold; genera Dopasia, Pseudopus, Opheosaurus and Opheodes: Opheomorinæ without side fold, and with transverse dorsal rows, Opheomorus: Anguinæ with shortened mesosternum, quincuncial dorsal scales and no lateral fold—Anguis: Diploglossinæ without lateral fold, with elongate anterior limb of mesosternum and quincuncial dorsal scales, containing Onida, Panolopus, Sauresia, (= *Embryopus* Weinl.) Diploglossus, Microlepis and Camilia: (in C. monotropis Pet. I have observed an apparent exception to the rule of the retractility of the end of the tongue in this tribe.)[†]

Of the Gerrhonotidæ I know but the two genera, Barissia and Gerrhonotus. *Xenosaurus* Pet. resembles the succeeding family rather than this; I have not had the opportunity of seeing its sternum.

Among the Leptoglossæ with a simple premaxillary, the Teidæ only have not the temporal fossæ roofed over by ossified, or much thickened dermal plates. The families may be thus compared:

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[*] Except Opheomorus.
[†] Vid. Proc. A N. S. 1862, 188.

α. Premaxillary single.

Temporal fossæ not roofed; tongue squamous papillose in oblique series, or squamous. Nostril in plate or suture: always a xiphisternal fontanelle.........	Teidæ.
Temporal fossæ roofed; tongue wholly or partially with oblique plicæ projecting forwards and inwards; nostril on intersquamal suture.........................	Lacertidæ.
Temporal fossæ roofed; tongue squamous; nostril in single plate..	Ecpleopidæ.

β. Premaxillary double.

Temporal fossa roofed. Tongue squamous. Nostril in a single plate; palatine maxillary laminæ dilated; rarely a xiphisternal fontanelle.........................	Scincidæ.
Temporal fossa roofed; tongue squamous. Nostril in notch of rostral; palatine maxillary laminæ often dilated..	Sepsidæ.

I do not know the complete characters of the Chalcidæ, but they are very near the Lacertidæ. The American Lepidophyma, Xantusia and Cricosaura enter the Lacertidæ, as here defined, as I have failed to find characters which separate them from this Old World family. The affinity to Zonurus, pointed out by Duméril, is manifested in the double parietals of the first two. Mancus and Gerrhosaurus enter the same family in all points—though the tongue is partially scaly—but in Zonurus there are two important exceptions in which it approaches Gerrhonotus, viz: the tongue is papillose, and the posterior limb bounding the clavicular foramen is wanting. Tretioscincus* enters the Ecpleopidæ, but presents the peculiarity of a simple clavicle. In a species of Brachypus I find the clavicle not always perforate, and in Trachysaurus the foramen is also wanting, although the dilatation is extensive. All these families, except the first, are known to possess serpentiform types; such are among the true Scincs, Siaphus, Hemiergis, Campsodactylus, etc. The last is a degraded form of Mabuia: in the second the articular and subarticular bones appear to be united: the first is, in all respects, typical of the family in its proper characters, as illustrated by the species at hand, S. simplex† mihi.

Pygopus and Lialis, with simple premaxillary, enter this tribe and are perhaps types of separate families. Whether Aprasia belongs in this or the next is as yet a question; it has some points of resemblance to Aniella.‡

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* T. bifasciatus, *Heteropus* Dum. *T. castanicterus* Cope.

† S. simplex. Nasals as high as broad, not meeting above rostral: internasal much broader than long, in contact with prefrenal. Frontonasals longest transversely, with an acute inner angle, not touching in front of frontal. Latter elongate cuneiform, three-sided in front. Supraorbitals four, posterior small; frontoparietals large, extensively in contact, occipitals large, long, nearly entirely separated by the interoccipital (which is long as the frontal) and bounded exteriorly by a long exoccipital. 5 superior labials. Transverse symphyseal and mental: 1st pair infralabials in contact, and two following pairs very elongate transversely. Twenty rows scales round the middle of the body, dorsal larger; four rows broader on nape. Three toes on anterior, *none* on posterior extremity. Color above steel brown, below dirty yellow; a yellowish occipitonuchal collar.

From end of muzzle to vent 3 in. 6 l. Vent to end of tail 4 in. 6 l. *Hab*. Australia.

‡ An allied genus, which will compel the union of the Aprasiidæ with the Pygopidæ, is Pletholax mihi, with the subjoined characters:—Posterior extremities, no preanal pores. Two pair of supranasals, nares between the anterior and first superior labial; one transverse frontonasal. Rostral oval, prominent. All the scales imbricated, with two keels and a groove between; no larger abdominal series. P. gracilis is *Pygopus gracilis*, Schlegel, (Mus. Leyden) to whom I am indebted for the opportunity of making this description. Occipitals broad, acuminate, as long as frontal and frontonasal. Three supraorbitals, posterior largest, Temporal scales large, keeled. Gulars keeled; one very large symphyseal followed on each side by two transverse labials, and these by two longitudinal narrow labials and two large infralabials. Sixteen rows of scales. Pale brown, a paler median dorsal band, two scales wide, bordered with dark brown. From South West Australia.

The families of the last tribe differ as follows:

a. Two suspensoria; nostril in the rostral shield. Tongue squamous.
Eye concealed by epidermis; occipital segment loosely attached. No frontal under-arch.................... Anelytropidæ.*
Eye distinct; occipital closely articulated; two premaxillaries.. Acontiidæ.
β. One suspensorim; nostril in a nasolabial plate; tongue papillose.
Eye distinct; occipital closely articulated; one premaxillary; an inferior frontal arch........................... Aniellidæ.

In the first family enter Typhlosaurus, Feylinia, (much the same is Typhloscincus) and Anelytrops. In these the columella is well developed. In Anelytrops there is a long squamosal articulated to the side of the parietal, as in Rhineüra and Cephalopeltis, the premaxillary is single, and palatine laminæ of the maxillary are dilated. The spleniomental groove is open. There are two slender clavicles united medially and giving insertion to the thoracic hæmapoyhyses. These, according to Rathke, are present, but not in contact in Acontias, and Peters and Stannius failed to find them in Typhlosaurus. The pelvis I find to be represented by an oblique bone at the extremities of two pairs of ribs on each side of the vent.

The remarkable genus Aniella lacks the squamosal and columella, and has a single premaxillary. The parietal is continuous with the superior plate of the temporal, and is much decurved toward the sphenoid; the frontal encloses the olfactory lobes below; these characters are the most amphisbænian in the order. There are small pre- and postfrontal bones, and a slender ligamentous postorbital arch. I have as yet found no sternal pieces, and the spleniomental groove is closed, as in Acontias.

The Ophidian suborders may be briefly summed up as follows:

a. Mastoid part of cranial walls: coronoid bone present.
I. No ectopterygoid. No prefontal. Maxillary without alveolar ridges or malar process. Rudiments of pelvis without pubis... SCOLECOPHIDIA.
II. No ectopterygoid. Prefontal present. Maxillary with alveolar ridge and malar process. Rudiments of pelvis with pubis... CATODONTA.†
III. An ectopterygoid, and prefrontal. Maxillary with alveolar ridges and teeth, horizontal, in contact with prefrontal... TORTRICINA.
β. Rudimentary posterior extremities..................... Tortricidæ.
ββ. No rudiments of extremities........................... Uropeltidæ.
aa. Mastoid not entering cranial walls, projecting. Ectopterygoid present.
IV. O. maxillare horizontal, produced to premaxillare, provided with solid teeth. No rudiments of pelvis. ASINEA.
a. Coronoid present; rudimental posterior extremities.
Coronoid and articular very elongate-slender. No postorbital or supraorbitals; premaxillary teeth. Xenopeltidæ.
Coronoid and articular short; post- and supraorbitals and premaxillary teeth.. Pythonidæ.‡
Coronoid and articular short; postorbitals; no supraorbitals or premaxillary teeth........................... Boidæ.
β. Coronoid bone wanting; no rudimental extremities.

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[*] Typhlinidæ *Gray*. The name Typhline is preoccupied.

[†] Vid. the important discovery of the pelvis by Peters, Monatsbe, Berlin Ac., 1863, 270.

[‡] Loxocemus enters this family rather than the next. Günther is right in assigning premaxillary teeth; posterior extremities, absent in his young specimen, are present in adults.

b. O. postorbitale produced over the superciliary region.. Achrochordidæ.*
bb. Postorbitale forming the hinder border of the orbit only. The families of this group have not yet been defined.
V. O. maxillare horizontal, thickened, and not reaching premaxillare anteriorly, in contact with prefrontale, bearing a perforate and usually grooved tooth PROTEROGLYPHA.
α. Caudal hypapophyses bifid. Neural spines and pleurapophyses short.
Postorbitals wanting; no splenio-mental groove........... Elapidæ.
Postorbitals present... Najidæ.
β. Caudal hypapophyses simple.
Neural spines and pleurapophyses elongate. A postfrontal bone.. Hydrophidæ.
VI. O. maxillare vertical, attached to prefontale by a ginglymus, and to the ectopterygoid without imbrication. Fang very seldom grooved.................. SOLENOGLYPHA.
Embracing the families Atractaspidæ, Causidæ, Viperidæ and Crotalidæ. For characters vid. Pr. A. N. Sci., 1859, 334.

On a Blind SILURID, from Pennsylvania.

BY E. D. COPE.

Animals deprived of the sense of sight are generally known inhabitants of subterranean areas of earth or water, although representing by their general structure, zoological groups most diverse. Among fish, two blind species of the Cod family are found in the caves of Cuba. The blind fish of the Mammoth Cave, with its sightless relative, the Typhlichthys, belong to a family represented by an eyed genus in the ditches of Carolina. Among the Catfish or Siluridæ there are sundry genera of a variety of form, in which the eyes are wanting or concealed by the skin. These are mostly South American or East Indian species, those of the latter country, of the Akysis type, approach nearest to our eyed Catfish of North America, according to the system of Bleeker. For a knowledge of the first genus of blind Silurid from our country, I am indebted to my friend Jacob Stauffer, Secretary of the Linnæan Society of Lancaster, an ardent explorer of the Zoology and Botany of Southern Pennsylvania, and who has furnished me with many valuable notes and specimens. This fish, of which specimens have been taken in the Conestoga creek, a tributary of the Susquehannah, is simply a blind representative of the ordinary type of Silurids, characteristic of North America, and is not to be arranged with the exotic groups. It, therefore, enters the group *Ictaluri*, of Gill, with our genera *Ameiurus*, *Hopladelus*, *Noturus* and *Ictalurus*, possessing especially the characters of the first. The genus may be called *Gronias*, and be explained by the following diagnosis:—Head broad, depressed. Supraoccipital bone posteriorly free. Branchiostegal membrane with ten rays. Anterior dorsal spine stout, posterior fin separated from caudal. Ventrals with eight rays. Eyes rudimental, covered by the corium. Natatory bladder present.

The species has the head broader posteriorly, and the anal fin shorter than in the allied species of Ameiurus. It may be called G. nigrilabris. The muzzle is flat and the jaws equal; the width across the occipital region is equal to the length from the end of the muzzle to the apex of the occipital crest; width below equal from the axilla of the pectoral to the base of the ventral fin. From end of muzzle to dorsal spine equal from latter to middle of adipose. Length of head four and one-fifth times in total length. Maxillary barbels extend three-fourths the distance to the opercular border; outer (longer) mentals scarcely beyond middle branchiostegal angle. Height of body at base of dorsal equal three-fourths length of head. End of pectoral opposite posterior border of first dorsal, its spinous ray serrate; ventrals not reaching anal. Basis of anal terminating a little behind base of adipose; length of caudal peduncle below, equal length of pectoral spine. Rays D. 1—7; P. 1—9; V. 8; A. 18; C. 16. Spine of dorsal smooth. Caudal openly emarginate, the emargination much above the middle rays, giving the highest a short lobate outline. Lateral line straight to scapular angle, mouth of axillary mucous duct distinct. Length of head 2 in. 8 l.; width below 2 in. 2 l.: from muzzle to base of ventrals 4 in. 3 l.; to base of caudal 7 in. 9 l.; length of caudal 1 in. 7 l.; another specimen is about ten inches in length. The color of the upper surfaces, tail, fins, barbels and under jaw is black; sides varied with dirty yellow, abdomen and thorax yellowish-white. J. Stauffer informs me that the dark pigment of the skin of this animal comes off upon the hands in handling it. A specimen died in twenty minutes after capture, when put in water, though uninjured; the Ameüri, like other Catfish, will live for many hours after complete removal from their element. It is occasionally caught by fishermen, and is supposed to issue from a subterranean stream, said to traverse the Silurian limestone in that part of Lancaster county, and discharge into the Conestoga.

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* Vid. Pr. A. N. S., 1860, 75.

Two specimens of this fish present an interesting condition of the rudimental eyes. On the left side of both a small perforation exists in the corium, which is closed by the epidermis, representing a rudimental cornea; on the other the corium is complete. Here the eyeball exists as a very small cartilaginous sphere with thick walls, concealed by the muscles and fibrous tissue attached, and filled by a minute nucleus of pigment. On the other the sphere is larger and thinner walled, the thinnest portion adherent to the corneal spot above mentioned; there is a lining of pigment. It is scarcely collapsed in one, in the other so closely as to give a tripodal section. Here we have an interesting transitional condition in one and the same animal, with regard to a peculiarity which has at the same time physiological and systematic significance, and is one of the comparatively few cases where the physiological appropriateness of a generic modification can be demonstrated. It is therefore not subject to the difficulty under which the advocates of natural selection labor, when necessitated to explain a structure as being a step in the advance towards, or in the recession from, any *unknown* modification needful to the existence of the species. In the present case observation on the species in a state of nature may furnish interesting results. In no specimen has a trace of anything representing the lens been found.

I am indebted to the same enterprizing Society and its Secretary for another inhabitant of the Conestoga, which has hitherto escaped the notice of zoologists. This species, which has been distinguished by Jacob Stauffer in correspondence, is an Etheostoma,* one possessing the character of the genus in a higher degree than does the best known type, the E. blennioides. This is, especially, the existence of a median abdominal series of thick shield-like scales, with short mucrones radiating from the free margins. In the type of the genus these scales are little larger than those of the ordinary form; in the present species they are four times the size of the largest on the body. The following description will express the general characters:—Etheostoma peltatum Stauffer; body and head more compressed and elevated, and the muzzle longer than in E. blennioides. Four times the length of the head (from below the opercular spine) extends a little beyond the base of the caudal fin, commencing at the end of the muzzle. Pectoral as long as head, and a little less than equal base of first dorsal. Greatest height equal from end of maxillary to edge of operculum. Eye 3½ times into length of head, measured to below opercular spine. Breadth of body through scapular region much greater than elsewhere. Scales $\begin{array}{c}7\\ \hline 53,\\ \hline 9\end{array}$ two rows on each side the lateral line longest. No scales in front of the first dorsal or on the head, except a very few on the operculum. A shield in the clavicular angle, one between the ventral fins, and six in a series commencing opposite the middle of the ventrals, and extending to vent; the last double. Dorsal fins well separated xiii—13. Caudal deeply lunate 17; A. 11; V. 6; P. 14. Total tength three inches. All the fins are finely barred, the ventrals but little, except the first dorsal, where a series of lunate black spots occupies the middle of the interradial membrane. The dorsal region is bright olive, with a series of short brown cross-bars. The lateral region is occupied by a longitudinal series of broad brownish shades; between these and on the belly and jaws orange and yellow. From spinous dorsal to occiput; from hinder frontal region to end of muzzle extending round front of orbits; a broad perpendicular bar from orbit downwards, and blotch on the operculum—black.

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* A species of the allied genus Pœcilichthys in the Mus. Academy Nat. Sci., from the Platte River, near Fort Kearney, Nebraska, presented by Dr. Hammond, appears to have been as yet undescribed. It may be called P. mesæus. A stout, little compressed species, with large scales. Dorsals not in contact. Eye entering five times into length of head, more than once in muzzle anterior to its border; head 4¼ times in total length. Caudal very rounded; first scarcely as high as second dorsal. Pectorals longer than ventrals, not reaching vent. Scales $\begin{array}{c}4\\ \hline 40.\\ \hline 5\end{array}$ Fin rays D. ix—13; P. 10; V. 1—4; A. 9; C. 2—14—1. Outline of back rather elevated. Length 2¼ inches. Beside the large size of the scales, the proportionally longer head and four soft ventral rays distinguish it from other species. The color in spirits is pale brown, with four dorsal blotches, and a few groups of zigzags on the sides. Second dorsal and caudal barred.

The collections also contain a series of species of Hololepis, which differ as follows, one being apparently undescribed:

Jacob Stauffer informs me that its movements are quick and lively, and that it presents a striking appearance in its native waters.

Lateral line to middle of first dorsal, on about 12 scales. Head 3¼ times in total length. D. viii—9; A. 9. Scales $\begin{array}{c}2\\ \hline 52.\\ \hline 9\end{array}$	fusiformis.
Lateral line on 12—16 scales, to middle of first dorsal. Scales $\begin{array}{c}3\\ \hline 42—4\\ \hline 7\end{array}$ Head four times in total length. Rays D. ix—10; A. 9.	erochroüs.
Lateral line on 23—8 scales to origin of second dorsal. Scales $\begin{array}{c}2\\ \hline 56\\ \hline 8\end{array}$ Head four times in total length. Rays D. x, xi—10, 11; A. 9.	barrattii.

Hololepis erochroüs is found in streams and dams, particularly near Brown's Mill in the eastern part of New Jersey, opposite Philadelphia. Its length is about two inches. The eye enters the length of the head five times, from end of muzzle to edge of orbit being one diameter of eye. Pectoral and ventral fins equal; rays of latter 1—5. A broad blackish band extends from the end of the muzzle to base of tail, covering one-third the height laterally and interrupted by reddish-yellow punctulations. Above the band pulverulent with reddish and rufous shades; below pale yellow in spirits, rarely with specks; color similar on the head below the band, except a vertical black streak below the eye This very pretty fish was found, and specimens presented to me, by my friend Jesse Burk, of this city.

FASTI ORNITHOLOGIÆ.

BY JOHN CASSIN.

> "There is no antidote against the opium of time, which temporarily considereth all things: our fathers find their graves in our short memories, and sadly tell us how we may be buried in our survivors."
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> "Oblivion is not to be hired. The greater part must be content to be as though they had not been; to be found in the register of God, not in the records of men. Twenty-seven names make up the first story before the flood, and the recorded names, ever since, contain not one living century. The number of the dead long exceedeth the living. The night of time far surpasseth the day, and who knows when was the equinox?"—*Sir Thomas Browne.*

No. 1.

Philipp Ludwig Statius Müller,

Professor der Naturgeschichte zu Erlang, Mitglied der Röm. Kaiserl. Akademie, wie auch der Berlinischen Gesellschaft der Naturforscher, &c.

Of this author I am acquainted with the following works which in part relate to Ornithology :

1. Deliciæ Naturæ Selectæ, oder auserlenes Naturalien Kabinet welches aus den drey Reichen der Natur zeiget, &c. 2 vols., Folio, Nürnberg, 1766, (edition in German and French,) many colored plates.
2. Same work, 2 vols., Folio, Dordrecht, 1771, (edition in Dutch.)
3. Des Ritters Carl von Linné vollständiges Natursystem, nach der zwölften lateinschen Ausgabe, &c., an edition of the Systema Naturæ of Linnæus in German, of which the Kingdom Animalia is by this author, in 9 vols., Octavo, 158 plates, Nürnberg, 1773 to 1776.

There are also numerous memoirs, translations and other works, the most extended and apparently the most complete enumeration of which is in Engelmann's Bibliotheca Historico-Naturalis. I have seen none other than the above relating to Ornithology.

In a series of papers, of which this is the first, I propose to bring to the notice of ornithologists, a very considerable number of authors, the works of whom have been either wholly or partially overlooked, or at least have not received that degree of attention to which they seem to have been, and in most instances are, surely entitled. All of those, whom I propose to notice, have written since the era of the Linnæan binomial nomenclature. Facilities unusually favorable for this description of investigation exist in the library of the Academy of Natural Sciences of Philadelphia, which is very rich in Zoology, especially of the older authors, owing mainly to the scientific taste and great liberality of the late Mr. William Maclure, of Dr. Thomas B. Wilson, and of Mr. Edward Wilson. Many of the most remarkable and rarest works were collected in Europe and presented to the Academy by the last named gentleman.

There are also in the library of the Smithsonian Institution at Washington, in that of the American Philosophical Society at Philadelphia, and in that of the Library Company of Philadelphia, valuable and but imperfectly known works, which are included within the objects of my proposed series, and to all of which, by virtue of their rules and through the courtesy of the officers of those institutions, I have unrestricted access. I propose to notice works, or parts of works, only which relate to Ornithology, and in a few instances to present notices of well known authors, for the purpose of giving condensed accounts of their works.

The bibliography of Ornithology is so extensive that no naturalist has yet mastered it, nor has been able to entirely appreciate and avail himself of the labors of his predecessors. There is, of course, much diversity of acquirement in this description of knowledge, and very generally an unqualified desire to attain the utmost possible proficiency. Instances occur, however, of exceeding ignorance and carelessness, and, in fact, it is not quite certain that the general disposition to, and respect for, research and erudition has not declined in Ornithology within the last quarter of a century, in a degree perhaps unusual in the Sciences. There is no reason that erudition in the literature of the Natural Sciences, through knowledge of books and the fullest research, should be less respectable than in any other department of Human Knowledge, nor that in those Sciences this description of acquirement should not be more respectable than ignorance. Here, too, as everywhere else, the great principles of Ethics, founded in the clear truths of Religion and Nature, should be allowed the most extended jurisdiction and control, without qualification. The morals of the Natural Sciences, most certainly, are not peculiar in any particular, nor involve principles different in any respect from those universally recognized in the practical pursuits of mankind, and which have elicited the most cordial assent and approbation of all civilized men. Justice, Honesty, Industry,—in fact, all the great practical and household virtues are as indispensable in the relations of cultivators of the Sciences past and present as elsewhere; possibly, it might be ventured to be suggested, ought to be rather, the more devotedly practised by men aspiring to be authors, and assuming somewhat to be teachers of mankind.

One prominent article of any code of zoological ethics that I might propose would be, that every author should be cited, and otherwise and in all respects treated justly and respectfully, so long as he can be found in print. It is perhaps safely to be assumed, also, that all authors ought to be treated courteously as well as justly, without reference to the extent of their publications, whether great or small. If belonging to that useful and laborious class of naturalists who are essentially describers of species—that class which possesses real knowledge, even if without hypotheses—their descriptions should be cited, and themselves too, as authorities, so long as such descriptions are known to exist. There is not, evidently, any other course consistent with Justice and the plainest principles of right and morality, and, in fact, no alternative, unless, indeed, an operator is disposed to set himself up for the first of all history, as is said of an early Chinese Emperor. The latter course, in a degree, singular as it may appear, is not entirely unknown to naturalists, especially to those who regard Science rather as a Milch Cow than as a transcendent Goddess—a distinction in classification first made by the great poet Schiller.

Persons addicted to hypotheses, otherwise sometimes rather loosely called Systematists and Generalizers, cannot be too careful in this description of respectful treatment, especially in view of the fact that the descriptive naturalists and students of species possess the great fund of real knowledge; and although describers of species *may* be nothing else, without the knowledge of such, no one *can* be anything else.* It is the descriptive naturalist, too, cooperating nowadays with the Anatomist and Chemist, who has brought forward the material so sharply testing the systems, that very few, in fact nearly *none*, have stood it! The tide of time is strewed with the wrecks of Systems and Generalizations, gone to a death worse than that of the dry bones of the Prophet, for they can never again live. The descriptive naturalists are the true rank and file, with many outriding skirmishers, and quasi great functionaries in attendance, garrulous, perhaps, and imperious, but of little real account; the true officers are from the ranks, and have worked their way.

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* Linnaeus says: "Botanices Tyro novit Classes, Canditatus omnia Genera, Magister plurimas species. Quo plures Botanicus noverit species, eo etiam praestantior est. Cognitione specierum innititur omnis solida eruditio Physica, Oeconomica, Medica; immo omnis vera cognitio humana." Philosophia Botanica, p. 202 (1751). These are the words of a right Sagamann.

The true Systematist is the greatest of them, and amongst the greatest of men, but comes, unfortunately, very rarely; scarcely more than one in a century. All men, or nearly so, seem capable of analysis, but true talent for generalization or synthesis is one of the rarest and most precious of the gifts of God. Inferences and occasional insights are accorded even to the most humble, but in all those beautiful and sublime Sciences which have their immediate origin in the observation of Nature, generalizations of any considerable value, or the inference of laws, are not easy nor likely to be proclaimed with any flippant dogmatism. The true and faithful man of genius is too surely appalled by the immensity of attempting, as Gœthe happily expresses it, "to think over again the great thoughts of the Creator."

The works of Prof. P. L. S. Müller seem to have been much overlooked in later times, though he was evidently well known, and is cited freely by his contemporaries.* He is quite a voluminous author and translator, though few of his works relate to Ornithology, those being, so far as I know, only such as are cited at the head of this paper, and especially his edition of the Systema Naturæ. His Supplemental Volume of this edition contains a large number of descriptions of species, generally abridged from other authors, and binomial names given for the first time. Throughout his edition Prof. Müller avails himself largely of Van Houttyn's fine edition of the Systema Naturæ, from which he copies nearly all his plates, and also of Boddaert's abridgement of the same, and from both of which (in the Dutch language) he freely translates. The latter is his main authority for his additional species. To the former I shall have occasion to allude in a future paper, but Boddaert's abridgement I must here further mention, on account of its immediate connexion with Prof. Müller's Supplementary Volume.

In 1772, Dr. P. Boddaert commenced in Holland the publication of an abridgement of the Systema Naturæ of Linnæus, under the title "Kortbegrip van het Zamenstel der Natuur, van der Heer C. Linnæus, met zeer veele zoorten vermeerdert door P. Boddaert Med. Doct.," of which I have seen one volume only, of 550 pages, octavo, containing the classes Mammalia and Aves. In this work Dr. Boddaert gives all of the species of Quadrupeds and Birds contained in the twelfth edition of the "Systema Naturæ," with the scientific names of Linnæus carefully stated, and with abridged descriptions in the Dutch language. He adds to those Linnæan species many others, mainly from Edwards, Catesby and Buffon, but especially the last named, citing constantly "Buff. Hist. Nat. Ois," the volume and page frequently, and always the plate of that distinguished author's great work universally known as "Planches Enluminées." To the species added by him he does not (in this work) give scientific names, but contents himself with popular names only, which are generally translations into Dutch of those given by other authors, and especially of the French names of Buffon.

It may not be improper to state, though without immediate connection here, that subsequently, in 1783, Dr. Boddaert gave scientific names himself to many of the species described and figured by Buffon, and of which he had previously given condensed descriptions in his "Kortbegrip." The title of this subsequent work is "Table des Planches Enluminéez d'Histoire Naturelle de M. D'Aubenton. Avec les denominations de MM. de Buffon, Brisson, Edwards, Linnæus et Latham, precedé d'une Notice des Principaux Ouvrages Zoologiques enluminées, par M. Boddaert, Med. Doct." Utrecht, 1783, 1 vol., small folio, 83 pages. Many of the names proposed by him in this work, and which are now generally adopted, are anticipated by those of Prof. Müller.

In 1773, the author now before us, Professor Philipp Ludwig Statius Müller, commenced at Nürnberg the publication of an edition in German of the "Systema Naturæ" of Linnæus, under the following title:—"Des Ritters Carl von Linné, Königlich Schwedischen Leibarztes, &c., &c., vollständiges Natursystem, nach der zwölften lateinischen Ausgabe und nach Anleitung des holländischen Houttuynischen Werks, mit einer ausfürlichen Erklärung ausgefertiget von Philipp Ludwig Statius Müller, Prof. der Naturgeschichte zu Erlang und Mitglied der Röm. Kais. Akademie der Naturforscher, &c." which was completed by him to the end of the Animal Kingdom. This work is contained in seven volumes, so styled, but bound in nine thick octavo volumes, including a "Supplements und Register Band," the date of publication of which is 1776, and of which it is especially the object of this paper to give some account.*

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* Donndorff, Zoologische Beyträge, Leipzig 1795, constantly gives "Müller Natursyst." as his first authority. Cited also constantly in Martini's "Allgemeine Geschichte der Natur," in Martini and Otto's edition of Buffon, in Gœze's "Europäische Fauna," and by various other authors.

This edition of Prof. Müller contains all the species given in the twelfth edition of the "Systema Naturæ," and in the Supplementary Volume he gives a large number of others, which are (as he states in the preface) from the "Addenda, Appendices und Mantissæ des Ritters von Linné," and the works of "Buffon, Schreber, Boddaert, Pallas und andern." The numbering of species under each genus is continued from the twelfth edition of the "Systema Naturæ."

In this volume Prof. Müller gives nearly all of the species of Birds described by Buffon, not previously given by Linnæus, and generally translates the Dutch names and descriptions of Boddaert's "Kortbegrip" into German. To very nearly all of his additional species, and perhaps especially to those from Boddaert, he gives scientific and strictly binomial names, which are, for many species, the first ever given to birds described and figured in Buffon's "Planches Enluminées." As stated above, Boddaert gave names himself to many of the same birds in 1783, but the date of Müller's Supplement is 1776, thus having clear priority.

In his Supplemental Volume, Prof. Müller gives a large number of species in other classes, and names some species of Quadrupeds, Reptiles and Insects apparently for the first time. His "Register über sämliche sechs Theile des Linneischen Thierreichs," in the same volume, appears to be a complete catalogue of all the species of *Animalia* contained in the twelfth edition of the Systema Naturæ of Linnæus, and seems to have been prepared very carefully. It is superior to Gmelin's Indices, (Syst. Nat. i. pt. vii.)

The following are the species of Birds given in this Supplementary Volume, and regarded by Prof. Müller as additional to the species of the Systema Naturæ. Those species which appear to be named for the first time are here given in small capitals.

The numbering of genera is the same as that of Linnæus, and the numbering of species is continued in the order of the twelfth edition of the Systema Naturæ. I have not attempted to give those species their places in modern genera, but quote only as synonymes the names of Boddaert, Gmelin and others.

Names of Birds given in the Supplementary Volume of Prof. Müller's edition of Linnæus' Systema Naturæ, and regarded by him as additional to those described in the twelfth original edition.

42. Genus FALCO, Linn.

33. Falco (Aquila) leucorypha, Pallas.
    Aquila leucorypha, Pall., Trav. i. p. 454 (1771.)

34. Falco regulus, Pallas, Trav. ii. p. 707 (1773.)

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* There are two other volumes, of which Dr. Johann Wolf is author, Nürnberg, 1796 and 1808, avowedly supplemental to Prof. Müller's edition of the Systema Naturæ. They contain Mammalia. There is also an abridgement of this edition in two volumes which I have not seen. Cuvier mentions Müller's edition, quite unjustly, (Regné Animal iv. p. 144 (1817).

43. Genus STRIX, Linn.

A. *Gehörnte Eulen.*

5a. Strix deminuta, Pallas, Trav. ii. p. 707 (1773.)

B. *Ungehörnte Eulen.*

13. Strix accipitrina, Pallas, Trav. i. p. 455 (1771.)

14. Strix uralensis, Pallas, Trav. i. p. 455 (1771.)

15. Strix pulchella, Pallas, Trav. i. p. 456 (1771.)

16. Strix caparoch, Müller, Syst. Nat. Supp. p. 69 (1776.)
Buff. Pl. Enl. i. p. 306. Strix ulula, Linn.

17. Strix cajennensis, Müller, Syst. Nat. Supp. p. 70 (1776.)
Strix cayennensis, Gm., Syst. Nat. i. p. 296 (1788.) Buff. Pl. Enl. 442

18. Strix dominicensis, Müller, Syst. Nat. Supp. p. 70 (1776.)
Strix dominicensis, Gm. Syst. Nat. i. p. 296 (1788.)
Buff. Pl. Enl. i. p. 313. Bodd. Kortb. p. 114.

44. Genus LANIUS.

27. "Lanius leucorinus, Linnæus."
Lanius leucorhynchus, Linn., Mant. p. 524 (1771.)

28. Lanius bicolor, Linn., Mant. p. 524 (1771.)

29. Lanius albus, Müller, Syst. Nat. Supp. p. 71 (1776.)

This description is short, and, to me, not recognizable as relating to any species. It is as follows:

"Man bringt aus den Westindien einen ganz weissen Neuntödter, welcher nur allein schwarze Schwungfedern hat, und von Herrn Boddaert mit angemerket worden." Boddaert's description is equally unsatisfactory, and without reference to any other author:

"Klauwier, die geheel wit is, met zwarte slag pennen: Woond in West Indien." Kortb. p. 118.

30. Lanius auriculatus, Müller, Syst. Nat. Suppl. p. 71 (1776.)
Lanius pomeranus, Sparrm., Mus. Carls. pl. i. (1786.)
Lanius rufus, Briss., Orn. i. p. 147 (1760.)
Lanius rutilus, Lath., Ind. Orn. i. p. 70 (1790.) Buff. Pl. Enl. 32, fig. 1.

Has priority of all names, except that of Brisson, and is sufficiently described by Prof. Müller, and especially mentioned as "Buffon's Piegrieche rousse." Brisson's name is generally adopted, but, in strict adherence to priority in the binomial method, this name has the right.

31. Lanius cajennensis, Müller, Syst. Nat. Supp. p. 72 (1776.)
Lanius nævius, Gm., Syst. Nat. i. p. 304 (1788.)
Buff. Pl. Enl. 377. Lanius cayanus, Linn.

32. Lanius viridis, Müller, Syst. Nat. Supp. p. 72 (1776.)
Lanius leucocephalus, Gm., Syst. Nat. i. p. 306 (1788.)
"Des Buffon's Tcha-Chert-be." Buff. Pl. Enl. 374.

33. Lanius cœruleus, Müller, Syst. Nat. Supp. p. 72 (1776,)
Lanius cœrulescens, Gm., Syst. Nat. i. p. 297 (1788.) Buff. Pl, Enl. 298, fig. 1.

34. Lanius Angrajen, Müller, Syst. Nat. Supp. p. 72 (1776.)
Lanius leucorhynchus, Linn., Mant. p. 524 (1771.)

35. **Lanius chabert**, Müller, Syst. Nat. Supp. p. 72 (1776.)
Lanius viridis, Gm., Syst. Nat. i. p. 306 (1788.) Buff. Pl. Enl. 32, fig. 2.
Lanius violaceus, Bodd., Tab. Pl. Enl. p. 3 (1783.)

45. Genus PSITTACUS.

A. *Langschwanze, mit keilformigem Schwanze.*

6*a*. Psittacus lineatus, Linn., Syst. Nat. iii. App. p. 223 (1768.)

6*b*. Psittacus hæmatodus, Linn., Mant. ii. p. 524 (1771.)

6*c*. **Psittacus maculatus**, Müller, Syst. Nat. Supp. p. 74 (1776.)
Psittacus luteus, Gm., Syst. Nat. i. p. 341 (1788.)
Psittacus luteus, Bodd., Tab. Pl. Enl. p. 30 (1783.)
Conurus maculatus, (Müller,) Buff., Pl. Enl. 525 ! !

6*d*. **Psittacus purpureus**, Müller, Syst. Nat. Supp. p. 74 (1776.)
Psittacus erythrocephalus, Gm., Syst. Nat. i. p. 325 (1788.) Buff., Pl. Enl. 264.
Psittacus gingianus, Lath., Ind. Orn. i. p. 99 (1790.)

6*e*. Psittacus carolinensis, Müller, Syst. Nat. Supp. p. 74 (1776.)
Buff., Pl. Enl. 499. P. carolinensis, Linn.

6*f*. **Psittacus fasciatus**, Müller, Syst. Nat. Supp. p. 74 (1776.)
Psittacus vibrissa, Bodd., Tab. Pl. Enl. p. 30 (1783.) Buff., Pl. Enl. 517.
Psittacus pondicerianus, Gm., Syst. Nat. i. p. 325 (1788.)

6*g*. **Psittacus ferrugineus**, Müller, Syst. Nat. Supp. p. 75 (1776.)
Psittacus smaragdinus, Gm., Syst. Nat. i. p. 322 (1788.) Buff., Pl. Enl. 85.

6*h*. **Psittacus leucopthalmus**, Müller, Syst. Nat. Supp. p. 75 (1776.)
Psittacus pavua, Bodd., Tab. Pl. Enl. pp. 10, 25 (1783.) Buff., Pl. Enl. 407.
Psittacus guianensis, Gm., Syst. Nat. i. p. 324 (1788.)

6*i*. **Psittacus versicolurus**, Müller, Syst. Nat. Supp. p. 75 (1776.)
Psittacus virescens, Gm., Syst. Nat. i. p. 326 (1788.) Buff., Pl. Enl. 359.

6*k*. Psittacus notatus, Müller, Syst. Nat. Supp. p. 75 (1776.)
Probably same as 6*h*. = P. pavua, Bodd. ? Buff., Pl. Enl. 167.

6*l*. **Psittacus pictus**, Müller, Syst. Nat. Supp. p. 75 (1776.)
Psittacus cyanopterus, Bodd., Tab. Pl. Enl. p. 9 (1783.)
Psittacus versicolor, Gm., Syst. Nat. i. p. 327 (1788.) Buff., Pl. Enl. 144.

6*m*. **Psittacus histrio**, Müller, Syst. Nat. Supp. p. 76 (1776.)
Psittacus indicus, Gm., Syst. Nat. i. p. 318 (1788.) Buff., Pl. Enl. 143.

B. *Kurzgeschwanzte.*

48. Psittacus Aurora, Linn., Mant. ii. p. 524 (1771.)

49. Psittacus mascarinus, Linn., Mant. ii. p. 524 (1771.)

50. Psittacus albus, Müller, Syst. Nat. Supp. p. 76 (1776.)
Buff., Pl. Enl. 263. Psittacus cristatus, Linn.

51. **Psittacus hæmaturopygius**, Müller, Syst. Nat. Supp. p. 77 (1776.)
Psittacus philippinarum, Gm., Syst. Nat. i. p. 331 (1788.) Buff., Pl. Enl. 191.

52. Psittacus roratus, Müller, Syst. Nat. Supp. p. 77 (1776.)
Vosmær, Naturk. Beschr. Vogel, pl. 7. Buff., Pl. Enl. 683.
Psittacus ceylonensis, Bodd., Tab. Pl. Enl. p. 42 (1783.)
Psittacus grandis, Gm., Syst. Nat. i. p. 335 (1788.)

53. Psittacus chinensis, Müller, Syst. Nat. Supp. p. 77 (1776.)
Psittacus ruber, Gm., Syst. Nat. i. p. 335 (1788.)
Buff., Pl Enl. 519. P. borneus, Linn.

54. Psittacus marginatus, Müller, Syst. Nat. Supp. p. 77 (1776.)
Psittacus gala, Bodd., Tab. Pl. Enl. p. 17 (1783.) Buff., Pl. Enl. 287.
Psittacus marginatus, Gm., Syst. Nat. i. p. 324 (1788.)
Psittacus lucionensis, Linn.?

55. Psittacus fuscus, Müller, Syst. Nat. Supp. p. 78 (1776.)
Psittacus violaceus, Bodd., Tab. Pl. Enl. p. 25 (1783.) Buff., Pl. Enl. 408.
Psittacus purpureus, Gm , Syst. Nat. i. p. 346 (1788.)

56. Psittacus versicolor, Müller, Syst. Nat. Supp. p. 78 (1776.)
Psittacus cyanorhynchus, Bodd., Tab. Pl. Enl. p. 22 (1783.)
Psittacus havanensis, Gm., Syst. Nat. i. p. 342 (1788.) Buff., Pl. Enl. 360.

57. Psittacus cajenneus, Müller, Syst. Nat. Supp. p. 78 (1776.)
Probably Buff., Pl. Enl. 312. P. æstivus, Linn.?

58. Psittacus pectoralis, Müller, Syst. Nat. Supp. p. 78 (1776.)
Psittacus polychloros, Scop., Flor. et Faun. Insub. ii. p. 87 (1786.)
Psittacus sinensis et magnus, Gm., Syst. Nat. i. pp. 337, 344 (1788.) Buff., Pl. Enl. 514.

59. Psittacus gutturalis, Müller, Syst. Nat. Supp. p. 79 (1776.)
Buff., Pl. Enl. 549. Psittacus leucocephalus, Linn.?

60. Psittacus ventralis, Syst. Nat. Supp. p. 79 (1776.)
Buff., Pl. Enl. 548. P. leucocephalus, var. ♂, Gmelin.
Chrysotis Sallæi, Sclater, Proc. Zool. Soc., London, 1857, p. 224?

61. Psittacus varius, Müller, Syst. Nat. Supp. p. 79 (1776.)
Edwards, Birds, pl. 163. Psittacus erythracus, Linn.?

Prof. Müller's description of this species is unusually short, and is not recognizable. It is probably copied from Bodd., Kortb., p. 144, who cites "Edwards, Birds, iv. 163."

62. Psittacus inquinatus, Müller, Syst. Nat. Supp. p. 79 (1776.)
Edwards, Birds, pl. 174. P. ornatus, Linn.

63. Psittacus arausiacus, Müller, Syst. Nat. Supp. p. 79 (1776.)
Psittacus Bouqueti, Bechst., ed. Lath. Syn.
Psittacus cyaneicapillus, Vieill., Encyc. Meth. p. 137.
Edwards, Birds, pl. 230. Seligmann, Samml. vii. pl. 13.

64. Psittacus aurantius, Müller, Syst. Nat. Supp. p. 80 (1776.)
Psittacus polychloros, Scop., Flor. et Faun. Insub. p. 87. Edwards, Birds, pl. 231.

Very probably same as No. 58, preceding.

65 Psittacus jugularis, Müller, Syst. Nat. Supp. p. 80 (1776.)
Psittacus Tovi, Gm., Syst. Nat. i. p. 351 (1788.) Buff., Pl. Enl. 190, fig. 1.
Psittacus flavigula, Bodd., Tab. Pl. Enl. p. 12 (1783.)

66. Psittacus capensis, Müller, Syst. Nat. Supp. p. 80 (1776.)

Psittacus cyanopterus, Bodd., Tab. Pl. Enl. p. 27 (1783.)
Psittacus capensis, Gm., Syst. Nat. i. p. 350 (1788.) Buff., Pl. Enl. 455, fig. 1.

67. Psittacus peruvianus, Müller, Syst. Nat. Supp. p. 80 (1776.)
Psittacus taitianus, Gm., Syst. Nat. i. p. 329 (1788.) Buff., Pl. Enl. 455, fig. 2.

Prof. Müller's description of this species seems to be condensed from that of Buffon's "L'Arimanon," Pl. Enl. vii. p. 141, pl. 455, fig. 2, but he says: "Sein Vaterland ist Peru." Boddaert says the same, "Woond in Peru."

68. Psittacus philippensis, Müller, Syst. Nat. Supp. p. 80 (1776.)
Buff., Pl. Enl. 520. P. galgulus, Linn.

69. Psittacus St. Thomæ, Müller, Syst. Nat. Supp. p. 81 (1776.)
Conurus Cassinii, G. R. Gray, Cat. Brit. Mus., Psittacidæ, p. 47 (1859.) Buff., Pl. Enl. 456, fig. 1.

70. Psittacus cajenneus, Müller, Syst. Nat. Supp. p. 81 (1776.)
Psittacus notatus, Bodd., Tab. Pl. Enl. p. 27 (1783.) Buff., Pl. Enl. 456, fig. 2.
Psittacus sosove, Gm., Syst. Nat. i. p. 352 (1788.)

This name is first and would be entitled to adoption, but was previously applied by Prof. Müller to a species that I cannot determine, from his description, No. 57 of this list.

71. Psittacus guineensis, Müller, Syst. Nat. Supp. p. 81 (1776.)
Buff., Pl. Enl. 60. Psittacus pullarius, Linn.

46. Genus RAMPHASTOS.

9. Ramphastos Toco, Müller, Syst. Nat. Supp. p. 80 (1776.)
Ramphastos Toco, Gm., Syst. Nat. i. p. 356 (1788.) Buff., Pl. Enl. 82.

10. Ramphastos Byron, Müller, Syst. Nat. Supp. p. 80 (1776.)
Ramphastos albus, Gm., Syst. Nat. i. p. 357 (1788.)
Buceros albus, Gm., Syst. Nat. i. p. 361 (1788.)

11. Ramphastos atricollis, Müller, Syst. Nat. Supp. p. 83 (1776.)
Buff., Pl. Enl. 166. Ramphastos aracari, Linn.

12. Ramphastos monilis, Müller, Syst. Nat. Supp. p. 83 (1776.)
Ramphastos erythrorhynchus, Gm., Syst. Nat. i. p. 355 (1788.) Buff., Pl. Enl. 262.

13. Ramphastos flavicollis, Müller, Syst. Nat. Supp. p. 83 (1776.)
Buff., Pl. Enl. 307. R. Tucanus, Linn.?

14. Ramphastos discolor, Müller, Syst. Nat. Supp. p. 83 (1776.)
Ramphastos torquatus, Gm., Syst. Nat. i. p. 354 (1788.)
Tucana Mexicana torquata, Briss., Orn. iv. p. 421.

15. Ramphastos pulcher, Müller, Syst. Nat. Supp. p. 84 (1776.)
Ramphastos pavoninus, Gm., Syst. Nat. i. p. 353 (1788.)
Tucana Mexicana viridis, Briss., Orn. iv. p. 423.

16. Ramphastos flavus, Müller, Syst. Nat. Supp. p. 84 (1776.)
Ramphastos luteus, Gm., Syst. Nat. i. p. 356 (1788.)
Tucana lutea, Briss., Orn. iv. p. 432.

17. Ramphastos glaucus, Müller, Syst. Nat. Supp. p. 84 (1776.)
Ramphastos cæruleus, Gm., Syst. Nat. i. p. 357 (1788.)
Tucana çœrulea, Briss., Orn. iv. p. 433.

50. Genus CORVUS.

20. CORVUS ALBUS, Müller, Syst. Nat. Supp. p. 85 (1776.)
Buff., Pl. Enl. 327. C. scapulatus, Daud.? C. curvirostris, **Gould.?**

21. Corvus fuscus, Müller, Syst. Nat. Supp. p. 85 (1776.)
Corvus leucogaster, Bodd., Tab. Pl. Enl. p. 15 (1783.)
Corvus flavus, Gm., Syst. Nat., i. p. 373 (1788.)
Buff., Pl. Enl. 249. Lanius sulphuratus, Linn.

22. Corvus ruber, Müller, Syst. Nat. Supp. p. 85 (1776.)
Buff., Pl. Enl. 538. C. afer et senegalensis, Linn.

23. CORVUS TRICOLOR, Müller, Syst. Nat. Supp. p. 85 (1776.)
Corvus calvus, Gm., Syst. Nat. i. p. 372. Buff., Pl. Enl. 521.

24. Corvus cinereus, Müller, Syst. Nat. Supp. p. 86 (1776.)
Buff., Pl. Enl. 523. Corvus Monedula, Linn.

51. Genus CORACIAS.

7. CORACIAS LEUCOCEPHALUS, Müller, Syst. Nat. Supp. p. 86 (1776.)
Coracias senegalensis, Gm., Syst. Nat. i. p. 379 (1788.) Buff., Pl. Enl. 326.

8. CORACIAS GLAUCURUS, Müller, Syst. Nat. Supp. p. 86 (1776.)
Coracias madagascariensis, Gm., Syst. Nat. p. 379 (1788.) Buff., Pl. Enl. 501.

52. Genus ORIOLUS.

21. Oriolus tricolor, Müller, Syst. Nat. Supp. p. 87 (1776.)
Buff., Pl. Enl. 506, fig. 2. Oriolus Baltimore, Linn.

22. Oriolus cucullatus, Müller, Syst. Nat. Supp. p. 87 (1776.)
Buff., Pl. Enl., 375, 376. Loxia melanocephala, Linn.
Oriolus textor, Gm., Syst. Nat. i. p. 390 (1788.)

23. ORIOLUS VIRIDIS, Müller, Syst. Nat. Supp. p. 87 (1776.)
Oriolus viridis, Bodd., Tab. Pl. Enl. p. 20 (1783.) Buff., Pl. Enl. 328.
Cassicus viridis, Vieill., Nouv. Dict. v. p. 364 (1816.)

24. ORIOLUS CITRIUS, Müller, Syst. Nat. Supp. p. 87 (1776.)
Oriolus cristatus, Bodd., Tab. Pl. Enl. p. 21 (1783.) Buff., Pl. Enl. 344.
Oriolus cristatus, Gm., Syst. Nat. i. p. 387 (1788.)

56. Genus BUCCO.

2. BUCCO VERSICOLOR, Müller, Syst. Nat. Supp. p. 88 (1776.)
Bucco pictus, Bodd., Tab. Pl. Enl. p. 20 (1783.) Buff., Pl. Enl. 330.
Bucco elegans, Gm., Syst. Nat. i. p. 406 (1788.)

3. BUCCO HÆMACEPHALUS, Müller, Syst. Nat. Supp. p. 88 (1776.)
Bucco flavigula, Bodd., Tab. Pl. Enl. p. 20 (1783.)
Bucco philippensis, Gm., Syst. Nat. i. p. 407 (1788.) Buff., Pl. Enl. 331.

4. BUCCO NIGER, Müller, Syst. Nat. Supp. p. 89 (1776.)
Bucco erythrocephalus, Bodd., Tab. Pl. Enl. p. 12 (1783.) Buff., Pl. Enl. 206, fig. 1.
Bucco cayennensis, Gm., Syst. Nat. i. p. 405 (1788.)

5. Bucco maculatus, Müller, Syst. Nat. Supp. p. 89 (1776.)
Same as No. 4.? Capito nævius, Vieill. Buff., Pl. Enl. 206, fig. 2.

The last two species are named from Buff., Pl. Enl. 206, fig. 1, 2, and are held to be the same by later ornithologists.

57. Genus CUCULUS.

23. Cuculus capensis, Müller, Syst. Nat. Supp. p. 90 (1776.)
  Cuculus capensis, Gm., Syst. Nat. i. p. 410 (1788.) Buff., Pl. Enl. 390.

24. Cuculus niger, Müller, Syst. Nat. Supp. p. 90 (1776.)
  Cuculus ater, Bodd., Tab. Pl. Enl. p. 30 (1783.)
  Corvus australis, Gm., Syst. Nat. i. p. 377 (1788.)
  Bucco cinereus, Gm., Syst. Nat. i. p. 409.
  Cuculus tranquillus, Gm., Syst. Nat. i. p. 417.
  Monasa niger, (Müller), Buff., Pl. Enl. 512. ! !

25. Cuculus Toulou, Müller, Syst. Nat. Supp. p. 90 (1776.)
  Cuculus melanorhynchus, Bodd., Tab. Pl. Enl. p. 18 (1783.)
  Cuculus Tolu, Gm., Syst. Nat. i. p. 422 (1788.)
  Centropus Toulou, (Müller,) Buff., Pl. Enl. 295, fig. 1. !

59. Genus PICUS.

22. Picus senegalensis, Müller, Syst. Nat. Supp. p. 91 (1776.)
  Picus senegalensis, Gm., Syst. Nat. i. p. 430 (1788.) Buff., Pl. Enl. 345, fig. 2.

23. Picus Goertæ, Müller, Syst. Nat. Supp. p. 91 (1776.)
  Picus Goertan, Gm., Syst. Nat. i. p. 434 (1788.) Buff., Pl. Enl. 320.

24. Picus striatus, Müller, Syst. Nat. Supp. p. 91 (1776.)
  Picus striatus, Gm., Syst. Nat. i. p. 427 (1788.) Buff., Pl. Enl. 281.
  Picus striatus, Bodd., Tab. Pl. Enl. p. 17 (1783.)

25. Picus flavus, Müller, Syst. Nat. Supp. p. 91 (1776.)
  Picus exalbidus, Gm., Syst. Nat. i. p. 428 (1788.) Buff., Pl. Enl. 509.
  Picus citrinus, Bodd., Tab. Pl. Enl. p. 30 (1783.)

26. Picus elegans, Müller, Syst. Nat. Supp. p. 92 (1776.)
  Picus cinnamomeus, Gm., Syst. Nat. i. p. 428 (1788.) Buff., Pl. Enl. 524.
  Picus fusco-fulvus, Bodd., Tab. Pl. Enl. p. 30 (1783.)

62. Genus ALCEDO.

16. Alcedo tridactylus, Linn., Mant. p. 524 (1771.)

17. Alcedo rubra, Müller, Syst. Nat. Supp. p. 93 (1776.)
  Vosmær, Natuurk. Besch. Vog. pl. 3. Galbula.

18. Alcedo galerita, Müller, Syst. Nat. Supp. p. 94 (1776.)
  Alcedo nigra, Bodd., Tab. Pl. Enl. p. 22 (1783.)
  Alcedo cæruleocephala, Gm., Syst. Nat. i. p. 449 (1788.)
  Corythornis galerita, (Müller,) Buff., Pl. Enl. 356, fig. 1.

19. Alcedo leucocephala, Müller, Syst. Nat. Supp. p. 94 (1776.)
  Halcyon rufiventer, Swain., B. of W. Afr. ii. p. 101 (1837.)
  Halcyon leucocephala (Müller,) Buff., Pl. Enl. 356, fig. 2.

20. Alcedo aurea, Müller, Syst. Nat. Supp. p. 94 (1776.)
  Vosmær, Natuurk. Besch. Vog. pl. 2. Galbula.

63. Genus MEROPS.

8. Merops americanus, Müller, Syst. Nat. Supp. p. 95 (1776.)
  Merops bicolor, Bodd., Tab. Pl. Enl. p. 15 (1783.) Buff., Pl. Enl. 252.

Merops badius, Gm., Syst. Nat. i. p. 462 (1788.)

The Professor seems to be incorrect in his geography in this instance. He gives the locality fairly enough: "Der Aufenthalt ist in Isle de France."

9. MEROPS PUSILLUS, Müller, Syst. Nat. Supp. p. 95 (1776.)
   Merops erythropterus, Gm., Syst. Nat. i. p. 464 (1788.) Buff., Pl. Enl. 318.
   Muscicapa bicolor, Bodd., Tab. Pl. Enl. p. 19 (1783.)

10. MEROPS GIGANTEUS, Müller, Syst. Nat. i. p. 95 (1776.)
   Merops cayenensis, Gm., Syst. Nat. i. p. 464 (1788.)
   Dendrocolaptes cayennensis, Temm. Pl. Col. vi. p. 66.
   Dendrocolaptes giganteus, (Müller)! Buff., Pl. Enl. 454.

11. Merops persica, Pallas, Trav. ii. p. 708 (1771.)

65. Genus CERTHIA.

26. Certhia capensis, Linnæus.
   Certhia capensis, Linn., Syst. Nat. i. p. 185 (1766.)?

This duplication of a name I do not understand, Professor Müller having previously given *Certhia capensis*, Linn., in his vol. ii. p. 255.

27. Certhia violacea, Linn., Mant. p. 525 (1771.)

28. Certhia intermedia, Müller, Syst. Nat. Supp. p. 98 (1776.)

This species I cannot distinguish. The description is "Diese seltene Art ist olivenfärbig grün, unten weiss, an der Brust mit schwarzen Flecken, wie manche Amsel oder Drossel, gefleckt. Die Ruderfedern laufen, wie ander Spechten, spitzig aus, der Schnabel aber, und die übrige Gestalt kommt mit den Baumläufern vollkommen überein. Das Vaterland ist Europa." Copied from Bodd. Kortb. p. 196, who cites no other author.

29. Certhia jugularis, Müller, Syst. Nat. Supp. p. 98 (1776.)
   Buff., Pl. Enl. 246, fig. 1. C. sperata, Linn.

30. Certhia cinerea, Müller, Syst. Nat. Supp. p. 98 (1776.)
   Buff., Pl. Enl. 576, fig. 2. C. currucaria, Linn.

31. Certhia tricolor, Müller, Syst. Nat. Supp. p. 99 (1776.)
   Buff., Pl. Enl. 576, fig. 4. C. zeylonica, Linn.

32. Certhia notatus, Müller, Syst. Nat. Supp. p. 99 (1776.)
   Buff., Pl. Enl. 575, fig. 2, 3. C. Lotentia, Linn.

66. Genus TROCHILUS.

1. Trochilus capensis, Linn., Mant. p. 525 (1771.)

2. Trochilus jugularis, Müller, Syst. Nat. Supp. p. 100 (1776.)
   Buff., Pl. Enl. 227, fig. 3. T. ourissia, Linn.?

67. Genus ANAS.

39*a*. Anas casarca, Linn., Syst. Nat. iii. p. 224 (1768.)

39*b*. Anas hyperborea, (Pallas.)
   Anser hyperboreus, Pall., Spic. Zool. vi. p. 25 (1769.)

39*c*. Anas Stelleri, Pall., Spic. Zool. vi. p. 35 (1769.)

46. Anas rufina, Pallas, Trav. ii. p. 713 (1773.)

47. Anas mersa, Pallas, Trav. ii. p. 713 (1773.)

69. Genus ALCA.

6. Alca cirrhata, Pallas, Spic. Zool. v. p. 7 (1769.)

7. Alca psittacula, Pallas, Spic. Zoöl. v. p. 13 (1769.)

8. "Alca cristata, Pallas, Spicil. fasc. v. tab. iii."
Alca cristatella, Pallas, Spic. Zool. v. p. 18 (1769.)

9. Alca tetracula, Pallas, Spic. Zool. v. p. 23 (1769.)

72. Genus PELECANUS.

4*a*. Pelecanus pygmæus, Pallas, Trav. ii. p. 712 (1773.)

75. Genus COLYMBUS.

12. **Colymbus duplicatus**, Müller, Syst. Nat. Supp. p. 107 (1776.)
Colymbus cristatus minor, Briss., Orn. vi. p. 42.
Colymbus cornutus, Gm., Syst. Nat. i. p. 591 (1788.)

13. **Colymbus St. Thomæ**, Müller, Syst. Nat. Supp. p. 107 (1776.)
Colymbus Thomensis, Gm., Syst. Nat. i. p. 592 (1788.)

76. Genus LARUS.

12. Larus Ichthyætus, Pallas, Trav. ii. p. 713 (1773.)

13. Larus albus, Müller, Syst. Nat. Supp. p. 108 (1776.)
Buff., Pl. Enl. 266. L. marinus, Linn., (young.)
Larus maculatus, Bodd., Tab. Pl. Enl. p. 16 (1783.)

84. Genus ARDEA.

6*a*. Ardea (Grus) leucogerana, Pallas.
Grus leucogeranus, Pall., Trav. ii. p. 714 (1773.)
Ardea gigantea, S. G. Gmelin, Trav. ii. p. 189.

6*b*. Ardea (Grus) mexicana, Müller, Syst. Nat. Supp. p. 110 (1776.)
A. canadensis, Linnæus.

6*c*. Ardea (Grus) Japonensis, Müller, Syst. Nat. Supp. p. 110 (1776.)
Japansche Reiger, Bodd., Kortb. p. 251.
Grus leucogeranos, Pallas, juv. ?

6*d*. Ardea (Grus) Buccinator, Müller, Syst. Nat. Supp. p. 110 (1776.)
Buff., Pl. Enl. 169. Psophia crepitans, Linn.

C. *Storche, Ciconiæ.*

8*a*. Ardea (Ciconia) fusca, Müller, Syst. Nat. Supp. p. 111 (1776.)
Buff., Pl. Enl. 399. Ardea nigra, Linn.

D. *Reiher, Ardeæ.*

27. Ardea pusilla, Müller, Syst. Nat. Supp. p. 111 (1776.)
"Die Farbe ist aschgrau, der Hals und die Brust aber sind weiss und schwarz gefleckt. Der Aufenthalt ist in Italien, Boddaert." Kleine Reiger, Bodd., Kortb. p. 253. No reference to other author.

28. **Ardea cristata**, Müller, Syst. Nat. Supp. p. 111 (1776.)
Ardea cærulescens, Lath., Ind. Orn. ii. p. 690 (1790.) Buff., Pl. Enl. 349.

29. **Ardea tricolor**, Müller, Syst. Nat. Supp. p. 111 (1776.)
Ardea leucogaster, Bodd., Tab. Pl. Enl. p. 21 (1783.) Buff., Pl. Enl. 350.
Ardea leucogaster, Gm., Syst. Nat. i. p. 628 (1788.)

30. Ardea comata, Pall., Trav. ii. p. 715 (1773.)

85. Genus TANTALUS.

8. Tantalus Courly, Müller, Syst. Nat. Supp. p. 112 (1776.)
Buff., Pl. Enl. 198. Scolopax madagascariensis, Linn.

9. Tantalus castaneus, Müller, Syst Nat. Supp. p. 112 (1776.)
" Le Falcinellus de Gesner et D'Aldrovande, de couleur sombre." Marsigli, Desc. du Danube, v. p. 41 (1744.)* T. Falcinellus, Linn.

87. Genus TRINGA.

24. Tringa Islandica, Linn., Syst. Nat. i. Addenda, (not paged, 1767.)

25. Tringa Senegallensis, Müller, Syst. Nat. Supp. p. 113 (1776.)
Buff., Pl. Enl. 362. Parra senegalla, Linn.

26. Tringa Hudsonica, Müller, Syst. Nat. Supp. p. 114 (1776.)
Edwards, Birds, pl. 141. Tringa interpres, Linn.

27. Tringa fusca, Müller, Syst. Nat. Supp. p. 114 (1776.)
Buff., Pl. Enl. 300. Tringa littorea, Linn.

88. Genus CHARADRIUS.

13. Charadrius gregarius, Pall., Trav. i. p. 456 (1771.)

14. Charadrius Asiaticus, Pall., Trav. ii. p. 715 (1773.)

15. Charadrius Tataricus, Pall., Trav. ii. p. 715 (1773.)

16. Charadrius Dominicus, Müller, Syst. Nat. Supp. p. 116 (1776.)
Pluvialis dominicensis aurea, Brisson, Orn. v. p. 48.
Charadrius virginicus, Auct. ?

17. Charadrius Anglus, Müller, Syst. Nat. Supp. p. 117 (1776.)
Morinellus anglicanus, Briss., Orn. v. p. 58 (1760.) Albin, Nat. Hist. Birds, ii. pl. 63.

18. CHARADRIUS JAMAICENSIS, Müller, Syst. Nat. Supp. p. 117 (1776.)
Charadrius Jamaicensis, Gm., Syst. Nat. i. p. 685 (1788.)
The larger grey Snipe, with a white neck. Brown, Nat. Hist. Jamaica, p. 477.

19. Charadrius Utopiensis, Müller, Syst. Nat. Supp. p. 117 (1776.)
Tringa nævia, Gm., Syst. Nat. i. p. 681. Buff., Pl. Enl. 365.

20. CHARADRIUS MEXICANUS, Müller, Syst. Nat. Supp. p. 117 (1776.)
Himantopus Mexicanus, Briss., Orn. v. p. 36.
Himantopus nigricollis, Vieill., Nouv. Dict. x. p. 42 (1817.)

21. CHARADRIUS BENGALENSIS, Müller, Syst. Nat. Supp. p. 118 (1776.)
Pluvialis Bengalensis major, Briss., Orn. v. p. 82.
Otis bengalensis, Gm., Syst. Nat. ii. p. 724 (1788.) Edwards, Birds, pl. 250.

22. Charadrius aureus, Müller, Syst. Nat. Supp. p. 118 (1776.)
Pluvialis aurea, Briss., Orn. v. p. 43. C. pluvialis, Linn.

91. Genus FULICA.

8. FULICA CAJANEA, Müller, Syst. Nat. Supp. p. 119 (1776.)
Fulica cayennensis, Gm., Syst. Nat. i. p. 700 (1780.) Buff., Pl. Enl. 352.
Fulica major, Bodd., Tab. Pl. Enl. p. 21 (1783.)

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* This work is rarely cited and apparently little known, even to European naturalists, though it is one of the most elaborate ever published. 6 vols., folio, with a large number of plates, in those of which devoted to Natural History nearly all the Birds of Europe are given.

93. Genus RALLUS.

11. Rallus capensis, Linn., Mant. p. 525 (1771.)

12. **Rallus viridis**, Müller, Syst. Nat. Supp. p. 120 (1776.)
Rallus cayenensis, Bodd., Tab. Pl. Enl. p. 22 (1783.)
Rallus cayennensis, Gm., Syst. Nat. i. p. 718 (1788.) Buff., Pl. Enl. 368.

98. Genus PAVO.

4. **Pavo Chinquis**, Müller, Syst. Nat. Supp. p. 121 (1776.)
Pavo tibetanus, Gm., Syst. Nat. i. p. 731 (1788.) Buff., Pl. Enl. ii. p. 385.

101. Genus PHASIANUS.

7. Phasianus superbus, Linn., Mant. p. 526 (1771.)

8. Phasianus cornutus, Müller, Syst. Nat. Supp. p. 125 (1776.)
Edwards' Birds, pl. 116. Meleagris Satyra, Linn.

9. **Phasianus Hoazin**, Müller, Syst. Nat. Supp. p. 125 (1776.)
Phasianus cristatus, Gm., Syst. Nat. i. p. 740 (1788.) Buff., Pl. Enl. 337.

10. **Phasianus Marail**, Müller, Syst. Nat. Supp. p. 125 (1776.)
Penelope Marail, Gm., Syst. Nat. i. p. 734 (1788.) Buff., Pl. Enl. 338.

11. Phasianus caracara, Müller, Syst. Nat. Supp. p. 125 (1776.)
Buff., Pl. Enl. ii. p. 407. Polyborus ?

12. **Phasianus chacamel**, Muller, Syst. Nat. Supp. p. 125 (1776.)
Penelope vociferans, Gm., Syst. Nat. i. p. 735 (1788.) Buff., Pl. Enl. ii. p. 409.

102. Genus NUMIDA.

2. Numida cristata, Pall., Spic. Zool. pt. iv. p. 15 (1767.)

3. "Numida coronata, Pallas, Miscell."
Probably *Numida mitrata*, Pall., Spic. Zool. iv. p. 18. There is no such species described in Pallas' "Miscellanea Zoologica."

103. Genus TETRAO.

A. *Federfüsse.*

9*a*. Tetrao senegallus, Linn., Mant. p. 526 (1771.)

9*b*. Tetrao paradoxa, Pall., Trav. ii. p. 712 (1773.)

B. *Kahlfüsse.*

21. Tetrao Europæus, Müller, Syst. Nat. Supp. p. 129 (1776.)
Tetrao montana, Bodd., Tab. Pl. Enl. p. 9 (1783.) Buff., Pl. Enl. 136.
Tetrao montanus, Gm., Syst. Nat. i. p. 758 (1788.)

22. **Tetrao afer**, Müller, Syst. Nat. Supp. p. 129 (1776.)
Tetra nudicollis, Bodd., Pl. Enl. p. 11 (1783.) Buff., Pl. Enl. 180.
Tetrao rubicollis, Gm., Syst. Nat. i. p. 758 (1788.)

23. **Tetrao chinensis**, Müller, Syst. Nat. Supp. p. 129 (1776.)
Tetrao perlatus, Gm., Syst. Nat. i. p. 758 (1788.) Buff., Pl. Enl. ii. p. 452.

24. **Tetrao colin**, Müller, Syst. Nat. Supp. p. 129 (1776.)
Tetrao novæ-hispaniæ, Gm., Syst. Nat. i. p. 763 (1788.) ? Buff., Pl. Enl. ii. p. 484.

25. TETRAO COYOLEUS, Müller, Syst. Nat. Supp. p. 129 (1776.)
Tetrao coyoleos, Gm., Syst. Nat. i. p. 763 (1788.) Buff., Pl. Enl. ii. p. 485.

26. TETRAO COLENICUI, Müller, Syst. Nat. Supp. p. 130 (1776.)
Tetrao mexicanus, Gm., Syst. Nat. i. p. 762 (1788.) Buff., Pl. Enl. 149.

104. Genus COLUMBA.

35*a*. Columba viridis, Müller, Syst. Nat. Supp. p. 132 (1776.)
Columba vernans, Linn., Mant. p. 526 (1771.)

35*b*. Columba australis, Linn., Mant. p. 526 (1771.)

35*c*. Columba amboinensis, Müller, Syst. Nat. Supp. p. 132 (1776.)
Columba aromatica, Gm., Syst. Nat. i. p. 778 (1788.) Buff., Pl. Enl. 163.

Not *C. amboinensis*, Linn., Syst. Nat. i. p. 286, which is given by Prof. Müller in his vol. ii. p. 514. He applies this name to the present species evidently inadvertently.

35*d*. Columba moluccensis, Müller, Syst. Nat. Supp. p. 133 (1776.)
Buff., Pl. Enl. 164. C. ænea, Linn.

35*e*. Columba indica, Müller, Syst. Nat. Supp. p. 133 (1776.)
Columba melanocephala, Gm., Syst. Nat. p. 781 (1788.) Buff., Pl. Enl. 214.

Not *C. indica*, Linn., Syst. Nat. i. p. 284 (1766.)

35*f*. COLUMBA SENEGALENSIS, Müller, Syst. Nat. Supp. p. 133 (1776.)
Columba vinacea, Gm., Syst. Nat. i. p. 782 (1788.) Buff., Pl. Enl., 161.

35*g*. COLUMBA JAVANENSIS, Müller, Syst. Nat. Supp. p. 133 (1776.)
Columba Turtur viridis, Bodd., Tab. Pl. Enl. p. 11 (1783.)
Columba javanica, Gm., Syst. Nat. i. p. 781 (1788.) Buff., Pl. Enl. 177.

35*h*. Columba asiatica, Müller, Syst. Nat. Supp. p. 133 (1776.)
Buff., Pl. Enl. 142. Columba viridis, Linn.

41. Columba histrio, Müller, Syst. Nat. Supp. p. 134 (1776.)
Columba migratoria, Linn. Buff., Pl. Enl. 176.

42. Columba fusca, Müller, Syst. Nat. Supp. p. 134 (1776.)
Buff., Pl. Enl. 175. Columba carolinensis, Linn.

43. COLUMBA MACERONA, Müller, Syst. Nat. Supp. p. 134 (1776.)
Columba macroura, Gm., Syst. Nat. i. p. 790 (1788.) Buff., Pl. Enl. 329.

This name "*macerona*" seems much like a typographical error.

44. Columba ventralis, Müller, Syst. Nat. Supp. p. 134 (1776.)
Buff., Pl. Enl. 176. Columba canadensis, Linn.

45. Columba atricollis, Müller, Syst. Nat. Supp. p. 135 (1776.)
Buff., Pl. Enl. 140. Columba capensis, Linn.

105. Genus ALAUDA.

12. Alauda Tatarica, Pall., Trav. ii. p. 707 (1773.)

13. Alauda cochevis, Müller, Syst. Nat. Supp. p. 136 (1776.)
Buff., Pl. Enl. 503, fig. 1. A. cristata, Linn.

14. Alauda plumata, Müller, Syst. Nat. Supp. p. 137 (1776.)
Buff., Pl. Enl. 503, fig. 2. Alauda arborea, Linn.
Alauda nemerosa, Gm., Syst. Nat. i. p. 797 (1788.)

15. ALAUDA SENEGALENSIS, Müller, Syst. Nat. Supp. p. 137 (1776.)
Alauda senegalensis, Gm., Syst. Nat. i. p. 797 (1788.) Buff., Pl. Enl. 504, fig. 1.
Alauda senegalensis, Bodd., Tab. Pl. Enl. p. 29 (1783.)

16. Alauda collaris, Müller, Syst. Nat. Supp. p. 137 (1776.)
Edwards, Birds, pl. 268. A. calandra, Linn.

17. Alauda calandre, Müller, Syst. Nat. Supp. p. 137 (1776.)
Buff., Pl. Enl. 363, fig. 2. A. calandra, Linn.

18. Alauda calandrotte, Müller, Syst. Nat. Supp. p. 137 (1776.)
Buff., Pl. Enl. 490. Turdus pilaris, Linn.

106. Genus STURNUS.

6. Sturnus militaris, Linn., Mant. p. 527 (1771.)

107. Genus TURDUS.

29. TURDUS PULCHER, Müller, Syst. Nat. Supp. p. 139 (1776.)
Turdus erythrogaster, Bodd., Tab. Pl. Enl. p. 22 (1783.) Buff., Pl. Enl. 358.
Turdus chrysogaster, Gm., Syst. Nat. i. p. 835 (1788.)

30. Turdus Merle, Müller, Syst. Nat. Supp. p. 139 (1776.)
Buff., Pl. Enl. 558, fig. 1. Turdus dominicus, Linn.

31. Turdus cajaneus, Müller, Syst. Nat. Supp. p. 139 (1776.)
Buff., Pl. Enl. 558, fig. 2. T. hispaniolensis, Gm.?
Muscicapa altiloqua, Vieill., Ois. d'Am. Sept. i. p. 67 (1807.)?

32. TURDUS MADAGASCARIENSIS, Müller, Syst. Nat. Supp. p. 139 (1776.)
Turdus Urovang, Gm., Syst. Nat. i. p. 836 (1788.) Buff., Pl. Enl. 557, fig. 2.

Gmelin also has a *Turdus madagascariensis*, Syst. Nat. i. p. 823, which name is a synonyme for the next species now given.

33. TURDUS AURATUS, Müller, Syst. Nat. Supp. p. 140 (1776.)
Turdus madagascariensis, Bodd., Tab. Pl. Enl. p. 32 (1783.) Buff., Pl. Enl. 557, fig. 1.
Turdus madagascariensis, Gm., Syst. Nat. i. p. 823 (1788.)

34. Turdus carolinus, Müller, Syst. Nat. Supp. p. 140 (1776.)
Turdus brunneus, Bodd., Tab. Pl. Enl. p. 32 (1783.) Buff., Pl. Enl. 556, fig. 2.

The figure here cited is one of the few of Buffon's Pl. Enl. which for me is impossible to be recognized.

35. Turdus canadensis, Müller, Syst. Nat. Supp. p. 140 (1776.)
Buff., Pl. Enl. 556, fig. 1. Turdus migratorius, Linn.

36. TURDUS CINEREUS, Müller, Syst. Nat. Supp. p. 140 (1776.)
Turdus cayennensis, Gm., Syst. Nat. i. p. 816 (1788.) Buff., Pl. Enl. 515.

37. Turdus americanus, Müller, Syst. Nat. Supp. p. 140 (1776.)
Turdus cayennensis, Gm., Syst. Nat. i. p. 816 (1788.) Buff., Pl. Enl. 515.

Dr. Boddaert gives two descriptions of the bird figured by Buffon, Pl. Enl. 515, citing the plate each time, (Kortb., pp. 341, 343). Prof. Müller gives the two names on the faith of Boddaert's descriptions, which he copies.

38. Turdus citreus, Müller, Syst. Nat. Supp. p. 141 (1776.)
Buff., Pl. Enl. 398, fig. 2. **Motacilla aurocapilla, Linn.**

39. Turdus mauvis, Müller, Syst. Nat. Supp. p. 141 (1776.)
Buff., Pl. Enl. 51. Turdus iliacus, Linn.

40. TURDUS MACULATUS, Müller, Syst. Nat. Supp. p. 141 (1776.)
Turdus ater, Gm., Syst. Nat. i. p. 830 (1788.) Buff., Pl. Enl. 559.

41. TURDUS FERRUGINEUS, Müller, Syst. Nat. Supp. p. 141 (1776.)
Turdus cinnamomeus, Gm., Syst. Nat. i. p. 825 (1788.) Buff., Pl. Enl 560.

42. Turdus superbus, Müller, Syst. Nat. Supp. p. 142 (1776.)
Buff., Pl. Enl. 561. Turdus nitens, Linn.

43. Turdus fuscus, Müller, Syst. Nat. Supp. p. 142 (1776.)
Buff., Pl. Enl. 563, fig. 1. Turdus cafer, Linn.

44. TURDUS SENEGALLUS, Müller, Syst. Nat. Supp. p. 142 (1776.)
Turdus lugubris, Bodd., Tab. Pl. Enl. p. 33 (1783.) Buff., Pl. Enl. 563, fig. 2.
Turdus senegalensis, Gm., Syst. Nat. i. p. 823 (1788.)

45. TURDUS VIRIDIS, Müller, Syst. Nat. Supp. p. 142 (1776.)
Turdus olivaceus, Bodd., Tab. Pl. Enl. p. 33 (1783.) Buff., Pl. Enl. 564, fig. 1.
Turdus indicus, Gm., Syst. Nat. i. p. 810 (1788.)

46. TURDUS SOLITARIUS, Müller, Syst. Nat. Supp. p. 142 (1776.)
Turdus manillensis, Gm., Syst. Nat. i. p. 833 (1788.) Buff., Pl. Enl. 564, fig. 2.

47. TURDUS PURPUREUS, Müller, Syst. Nat. Supp. p. 143 (1776.)
Turdus juidæ, Bodd., Tab. Pl. Enl. p. 31 (1783.) Buff., Pl. Enl. 540.
Turdus auratus, Gm., Syst. Nat. i. p. 819 (1788.)

48. Turdus palmista, Müller, Syst. Nat. Supp. p. 143 (1776.)
Buff., Pl. Enl. 539, fig. 1. Turdus palmarum, Linn.

49. TURDUS CASTANEUS, Müller, Syst. Nat. Supp. p. 143 (1776.)
Turdus nigerrimus, Gm., Syst. Nat. i. p. 821 (1788.) Buff., Pl. Enl. 539, fig. 2.
Turdus Jala, Bodd., Tab. Pl. Enl. p. 31 (1783.)

50. Turdus europæus, Müller, Syst. Nat. Supp. p. 143 (1776.)
Buff. Pl. Enl. 182. Turdus torquatus, Linn. (*juvenis.*)

51. TURDUS SORDIDUS, Müller, Syst. Nat. Supp. p. 143 (1776.)
Turdus brevicauda, Bodd. Tab. Pl. Enl. p. 6 (1783.)
Corvus philippensis, Gm. Syst. Nat. 1 p. 375 (1788.)
Pitta atricapilla, Auct. Buff. Pl. Enl. 89.

52. TURDUS CAUDATUS, Müller, Syst. Nat. Supp. p. 144 (1776.)
Turdus longicauda, Bodd. Tab. Pl. Enl. p. 13 (1783.) Buff. Pl. Enl. 220.
Turdus aeneus, Gm. Syst. Nat. 1. p. 818 (1788.)

53. TURDUS MOLUCCENSIS, Müller, Syst. Nat. Supp. p. 144 (1776.)
Corvus madagascariensis, Gen. Syst. Nat. 1 p. 376 (1788.)
Pitta cyanoptera, Temm. Pl. Col. vi. p. 16. Buff. Pl. Enl. 257.

54. Turdus coronatus, Müller, Syst. Nat. Supp. p. 144 (1776.)
Corvus bengalensis, Gm. Syst. Nat. i. p. 376 (1788.)
Corvus brachyurus, Linn. Buff. Pl. Enl. 258.

55. TURDUS GUTTURALIS, Müller, Syst. Nat. Supp. p. 144 (1776.)
Buff. Pl. Enl. 272. Turdus zeylonus, Linn.
L. Bacbakiri, Shaw.

This name has precedence of all others, except that of Linnæus, which is erroneous geographically.

56. Turdus dominicus, Müller, Syst. Nat. Supp. p. 145 (1776.)
Turdus terat, Bodd. Tab. Pl. Enl. p. 16 (1783.) Buff. Pl. Enl. 273, fig. 2.
Turdis orientalis, Gm. Syst. Nat. i. p. 821 (1788.)

57. Turdus indicus, Müller, Syst. Nat. Supp. p. 145 (1776.)
Turdus virens, Bodd. Tab. Pl. Enl. p. 17 (1783.) Buff. Pl. Enl. 273, fig 1.
Turdus virens hispaniolensis, Gm. Syst. Nat. i. p. 822 (1788.)

These two species, 56 and 57, are the birds represented in Buff. Pl. Enl. 273, but Professor Müller has reversed them. The "Merle des Indes Orientales" is his *T. dominicus*, and the "Merle de St. Domingo" his *T. indicus*. The reverse would have been correct, and his names applicable geographically.

58. TURDUS TRISTIS, Müller, Syst. Nat. Supp. p. 145 (1776.)
Turdus nigricans, Vieill. Nouv. Dict. xx. p. 253 (1818.) Buff. Pl. Enl. 317.

59. TURDUS PHILIPPENSIS, Müller, Syst. Nat. Supp. p. 145 (1776.)
Turdus philippensis, Bodd., Tab. Pl. Enl. p. 21, (1783.) Buff. Pl. Enl. 339.
Turdus eremita, Gm. Syst. Nat. i. p. 833 (1788.)

60. TURDUS PODOBE, Müller, Syst. Nat. Supp. p. 145 (1776.)
Turdus erythropterus, Gm. Syst. Nat. i. p. 835 (1788.) Buff. Pl. Enl. 354.

61. TURDUS CYANEUS, Müller, Syst. Nat. Supp. p. 145 (1776.)
Turdus atricapillus, Gm. Syst. Nat. i. p. 822 (1788.) Buff. Pl. Enl. 392.

62. Turdus guajanus, Müller, Syst. Nat. Supp. p. 145 (1776.)
Buff. Pl. Enl. 355. "Merle de la Guiane."
Turdus cyanurus, Bodd. Tab. Pl. Enl. p. 21. (1783.)
Turdus cyanurus, Gm. Syst. Nat. i. p. 828 (1788.)

This name has priority, but is erroneous geographically, Prof. Müller having been misled by Buffon's name "Merle de la Guiane." Boddaert commits the same error following Buffon.

63. Turdus Rousserolle, Müller, Syst. Nat. Supp. p. 145 (1776.)
Buff. Pl. Enl. 513. T. arundinaceus, Linn.

108. Genus AMPELIS.

4*a*. AMPELIS MACULATUS, Müller, Syst. Nat. Supp. p. 147 (1776.)
Ampelis cærulea, Vieill. ? Buff. Pl. Enl. 188.

109. Genus LOXIA.

49. Loxia orix, Linn. Mant. p. 527 (1771.)

50. Loxia sibirica, Pallas, Trav. ii. p. 711 (1773.)

51. LOXIA CRISTATA, Müller, Syst. Nat. Supp. p. 149 (1776.)
Loxia cucullata, Lath. Ind. Orn. i. p. 378 (1790.) Buff. Pl. Enl. 103.

52. LOXIA CAUDATA, Müller, Syst. Nat. Supp. p. 149 (1776.)
Colius senegalensis, Gm. Syst. Nat. i. p. 842 (1788.) Buff. Pl. Enl. 282, fig. 2.

53. Loxia melanocephala, Müller, Syst. Nat. Supp. p. 150 (1776.)
Buff. Pl. Enl. 309, fig. 2. Loxia oryx, Linn.

54. Loxia maja, Müller, Syst. Nat. Supp. p. 150 (1776.)
Buff. Pl. Enl. 109, fig. 1, 2. Loxia maja, Linn.

55. Loxia leucura, Müller, Syst. Nat. Supp. p. 150 (1776.)
Buff. Pl. Enl. 135, fig. 1. L. enucleator, Linn.

56. Loxia maculata, Müller, Syst. Nat.. Supp. p. 150 (1776.)
Buff. Pl. Enl. 135, fig. 2. L. philippina, Linn.

57. Loxia Moineau, Müller, Syst. Nat. Supp. p. 150 (1776).
Buff. Pl. Enl. 134, fig. 1. L. oryx, Linn.

58. Loxia coromandela, Müller, Syst. Nat. Supp. p. 151 (1776.)
Buff. Pl. Enl. 101, fig. 1. Loxia capensis, Linn.

59. Loxia Jacobin, Müller, Syst. Nat. Supp. p. 151 (1776.)
Buff. Pl. Enl. 139, fig. 3. Loxia malacca, Linn.

60. Loxia undulata, Müller, Syst. Nat. Supp. p. 151 (1776.)
Buff. Pl. Enl. 139, fig. 1. L. punctularia, Linn.

61. LOXIA LATICAUDA, Müller, Syst. Nat. Supp. p. 151 (1776.)
Loxia flabellum, Bodd. Tab. Pl. Enl. p. 23 (1783.) Buff. Pl. Enl. 380.
Loxia flabellifera, Gm. Syst. Nat. i. p. 850 (1788.)

62. Loxia rubricollis, Müller, Syst. Nat. Supp. p. 151 (1776.)
Buff. Pl. Enl. 153, fig. 2. L. ludoviciana, Linn. ?

63. Loxia Nonette, Müller, Syst. Nat. Supp. p. 151 (1776.)
Loxia cucullata, Bodd. Tab. Pl. Enl. p. 24 (1783.)
Buff. Pl. Enl. 393, fig. 3. L. collaria, Linn.

64. Loxia aurata, Müller, Syst. Nat. Supp. p. 152 (1776.)
Loxia Regina, Bodd. Tab. Pl. Enl. p. 24 (1783.)
Buff. Pl. Enl. 393, fig. 2. L. benghalensis, Linn. ?

65. Loxia Papa, Müller, Syst. Nat. Supp. p. 152 (1776.)
Buff. Pl. Enl. 159, fig. 1, 2. Emberiza ciris, Linn.

66. Loxia cucullata, Müller, Syst. Nat. Supp. p. 152 (1776.)
Buff. Pl. Enl. 223, fig. 1. Fringilla senegala, Linn.

67. LOXIA NIGRA, Müller, Syst. Nat. Supp. p. 152 (1776.)
Fringilla splendens, Vieill. Nouv. Dict. xii. p. 173 (1817.) Buff. Pl. 224, fig. 3.

68. LOXIA NOTATA, Müller, Syst. Nat. Supp. p. 152 (1776.)
Fringilla melanoleuca, Gm. Syst. Nat. i. p. 910 (1788.) Buff. Pl. Enl. 224, fig. 2.

69. LOXIA FIMBRIATA, Müller, Syst. Nat. Supp. p. 153 (1776.)
Fringilla melanictera, Gm. Syst. Nat. i. p. 910 (1788.) Buff. Pl. Enl. 224, fig. 1.

70. LOXIA MELANURA, Müller, Syst. Nat. Supp. p. 153 (1776.)
Fringilla arcuata, Gm. Syst. Nat. i. p. 912 (1788.) Buff. Pl. Enl. 230. fig. 1.

71. LOXIA ERYTHROPTHALMA, Müller, Syst. Nat. Supp. p. 153, (1776.)
Fringilla rosea, Bodd., Tab. Pl. Enl. p. 14, (1783.) Buff., Pl. Enl. 230, fig. 2.

72. Loxia hæmorrhoidalis, Müller, Syst. Nat. Supp., p. 153, (1776.)
Fringilla Commersonia, Bodd., Tab. Pl. Enl. p. 14, (1783.) Buff., Pl. Enl. 230, fig. 3.

73. Loxia Verdier, Müller, Syst. Nat. Supp. p. 153, (1776.)
Buff., Pl. Enl. 341, fig. 1. L. butyracea, Linn.

74. Loxia liturata, Müller, Syst. Nat. Supp. p. 153, (1776.)
Loxia dominicensis, Gm., Syst. Nat. i. p. 855, (1788.) Buff., Pl. Enl. 341, fig. 2.

75. Loxia Bourbonensis, Müller, Syst. Nat. Supp. p. 154, (1776.)
Loxia nigro-aurantia, Bodd., Tab. Pl. Enl. p. 12, (1783.) Buff., Pl. Enl. 204, fig. 1.
Loxia aurantia, Gm., Syst. Nat. i. p. 853, (1788.)
Spermophila Daubentoni, G. R. Gray?

76. Loxia Bouvreuil, Müller, Syst. Nat. Supp. p. 154, (1776.)
Buff., Pl. Enl. 204, fig. 2.

77. Loxia conchata, Müller, Syst. Nat. Supp. p. 154, (1776.)
Loxia bicolor, Linn., Syst. Nat. i. p. 307, (1766?)
Loxia fusciventer, Bodd., Tab. Pl. Enl. p. 20, (1783.) Buff., Pl. Enl. 319, fig. 2.
Loxia minuta, Gm., Syst. Nat. i. p. 865, (1788.)

78. Loxia crispa, Müller, Syst. Nat. Supp., p. 154, (1776.)
Buff., Pl. Enl. 319, fig. 1. Loxia lineola et Fringilla crispa, Linn.

110. Genus EMBERIZA.

25. Emberiza passerina, Pall., Trav. i. p. 456, (1771.)

26. Emberiza pithyornis, Pall., Trav. ii. p. 710, (1773.)

27. Emberiza aureola, Pallas, Trav. ii. p. 711, (1773.)

28. Emberiza notata, Müll., Syst. Nat. Supp. p. 157, (1776.)
Emberiza lotharingica, Gm., Syst. Nat. i. p. 882. Buff., Pl. Enl. 511, fig. 2.

29. Emberiza Moineau, Müller, Syst. Nat. Supp. p. 157, (1776.)
Loxia macroura, Gm., Syst. Nat. i. p. 845, (1788.)
Pentheria Moineau, (Müller)! Buff., Pl. Enl. 183, fig. 1.

111. Genus TANAGRA.

25. Tanagra varia, Müller, Syst. Nat. Supp. p. 158, (1776.)
Buff., Pl. Enl. 301, fig. 1. T. Sayaca, Linn.

26. Tanagra viridis, Müller, Syst. Nat. Supp. p. 158, (1776.)
Buff., Pl. Enl. 7. T. tatao, Linn.

27. Tanagra Seledon, Müller, Syst. Nat. Supp. p. 158, (1776.)
Tanagra tricolor, Gm., Syst. Nat. i. p. 891, (1788.) Buff., Pl. Enl. 33, fig. 1.

28. Tanagra cyanocephala, Müller, Syst. Nat. Supp. p. 159, (1776.)
Tanagra festiva, Shaw, Nat. Misc. xiii. pl. 537, (1804?) Buff., Pl. Enl. 33, fig. 2.
Tanagra cyanocephala, Vieill., Nouv. Dict. xxxii. p. 425, (1819.)

29. Tanagra nigra, Müller, Syst. Nat. Supp. p. 159, (1776.)
Buff., Pl. Enl. 179, fig. 1. Tanagra brasiliensis, Linn.

30. TANAGRA MAXIMA, Müller, Syst. Nat. Supp. p. 159, (1776.)
Tanagra magna, Gm., Syst. Nat. i. p. 890, (1788.)
Saltator maxima (Müller) ! Buff., Pl. Enl. 205.

31. Tanagra mitrata, Müller, Syst. Nat. Supp. p. 159, (1776.)
Buff., Pl. Enl. 290, fig. 1. T. cayana, Linn.

32. Tanagra pompadora, Müller, Syst. Nat. Supp. p. 159, (1776.)
Buff., Pl. Enl. 128. Tanagra jacapa, Linn.

33. Tanagra fusca, Müller, Syst. Nat. Supp. p. 159, (1776.)
Buff., Pl. Enl. 155, fig. 2. T. gularis, Linn.

34. Tanagra elegans, Müller, Syst. Nat. Supp. p. 160, (1776.)
Buff., Pl. Enl. 114, fig. 1. T. violacea, Linn.

112. Genus FRINGILLA.

42. FRINGILLA MOZAMBICA, Müller, Syst. Nat. Supp. p. 163, (1776.)
Fringilla ictera, Vieill., Nouv. Dict. xii. p. 170, (1817.)
Serinus mozambica (Müller). Buff., Pl. Enl. 364.

43. Fingilla fusca, Müller, Syst. Nat. Supp. p. 163, (1776.)
Buff., Pl. Enl. 151, fig. 1. Fringilla cannabina, Linn.
Fringilla linota. Gm., Syst. Nat. i. p. 916, (1788.)

44. Fringilla vitis, Müller, Syst. Nat. Supp. p. 163, (1776.)
Buff., Pl. Enl. 151, fig. 2. Fringilla linaria, Linn.

45. Fringilla cardinalis, Müller, Syst. Nat. Supp. p. 163, (1776.)
Buff., Pl. Enl. 6, fig. 2. Loxia oryx, Linn.

46. Fringilla Taria, Müller, Syst. Nat. Supp. p. 163, (1776.)
Buff., Pl. Enl. 292. Fringilla tristis, Linn. (*juvenis*).

47. Fringilla projer, Müller, Syst. Nat. Supp. p. 164, (1776.)
Buff., Pl. Enl. 233. Emberiza miliaria, Linn. (*juvenis*).

48. Fringilla cerata, Müller; Syst. Nat. Supp. p. 164, (1776.)
Buff., Pl. Enl. 157, fig.1. F. senegala, Linn.

49. Fringilla diadema, Müller, Syst. Nat. Supp. p. 164, (1776.)
Buff., Pl. Enl. 225. Fringilla Petronia, Linn.

50. FRINGILLA FLAVA, Müller, Syst. Nat. Supp. p. 164, (1776.)
Emberiza brasiliensis, Gm., Syst. Nat. i. p. 872, (1788.) Buff., Pl. Enl. 321, fig. 1.

51. FRINGILLA BRUANTE, Müller, Syst. Nat. Supp. p. 164, (1776.)
Emberiza fusco-fulva, Bodd., Tab. Pl. Enl. p. 20, (1783.) Buff., Pl. Enl. 321, fig. 2.
Emberiza borbonica, Gm., Syst. Nat. i. p. 886, (1788.)

52. Fringilla capensis, Müller, Syst. Nat. Supp. p. 165, (1776.)
Emberiza pileata, Bodd., Tab. Pl. Enl. p, 23. (1783.) Buff., Pl. Enl. 386, fig. 2.

A common South American species with abundance of names, of which this is the first, but erroneous geographically. Müller follows Buffon, who gives the locality as Cape of Good Hope. Boddaert does the same. (Kortb. p. 397.)

53. FRINGILLA MEXICANA, Müller, Syst. Nat. Supp. p. 165, (1776.)
Emberiza mexicana, Bodd., Tab. Pl. Enl. p. 23, (1783.) Buff., Pl. Enl. 386, fig. 1.
Emberiza mexicana, Gm., Syst. Nat. i. p. 873, (1788.)

54. Fringilla linotte, Müller, Syst. Nat. Supp. p. 165, (1776.)
Buff., Pl. Enl. 485, fig. 1. Fringilla cannabina, Linn.?

55. FRINGILLA CABARET, Müller, Syst. Nat. Supp. p. 165,)1776.)
Fringilla minima, Bodd., Tab. Pl. Enl. p. 28, (1783.) Buff., Pl. Enl. 485, fig. 2.
Linaria rufescens, Vieill.

56. Fringilla fasciata, Müller, Syst. Nat. Supp. p. 165, (1776.)
Buff., Pl. Enl. 485, fig. 3. Fringilla spinus, Linn.

57. FRINGILLA CHALYBEATA, Müller, Syst. Nat. Supp. p. 166, (1776.)
Fringilla nitens, Gm., Syst. Nat. i. p. 909, (1788.) Buff., Pl. Enl. 291, fig. 1.

58. Fringilla Dominicana, Müller, Syst. Nat. Supp. p. 166, (1776.)
Fringilla larvata, Bodd., Tab. Pl. Enl. p. 4, (1783.)
Buff., Pl. Enl. 55, fig. 2. Loxia dominicana, Linn.

59. FRINGILLA CUCULLATA, Müller, Syst. Nat. Supp. p. 166, (1776.)
Passer cristatus, Bodd., Tab. Pl. Enl. p. 11, (1783.) Buff., Pl. Enl. 181, fig. 1.
Fringilla cristata, Gm., Syst. Nat. i. p. 926, (1788.)

60. Fringilla rubricollis, Müller, Syst. Nat. Supp. p. 166, (1776.)
Buff., Pl. Enl. 182, fig. 2. Loxia oryx, Linn.

61. FRINGILLA CONCHATA, Müller, Syst. Nat. Supp. p. 166, (1776.)
Fringilla speciosa, Bodd., Tab. Pl. Enl. p. 12, (1783.) Buff., Pl. Enl. 203, fig. 1.
Fringilla elegans, Gm., Syst. Nat. i. p. 912, (1788.)

62. FRINGILLA CŒRULEA, Müller, Syst Nat. Supp. p. 167, (1776.)
Tanagra cœrulea, Gm., Syst. Nat. i. p. 891, (1788.) Buff., Pl. Enl. 203, fig. 2.

113. Genus MUSCICAPA.

22. MUSCICAPA CAUDATA, Müller, Syst. Nat. Supp. p. 168, (1776.)
Muscicapa viridescens, Bodd., Tab. Pl. Enl. p. 15, (1783.) Buff., Pl. Enl. 248, fig. 1.
Muscicapa holosericea, Temm.

23. MUSCICAPA CORONATA, Müller, Syst. Nat. Supp. p. 168, (1776.)
Todus regius, Gm., Syst. Nat. i. p. 445, (1788.)
Muscivora coronata, (Müller)! Buff., Pl. Enl. 289.

24. Muscicapa Virginea, Müller, Syst. Nat. Supp. p. 168, (1776.)
Buff., Pl. Enl. 569, fig. 1. M. crinita, Linn.

25. Muscicapa leucocephala, Müller, Syst. Nat. Supp. p. 169, (1776.)
Buff., Pl. Enl. 569, fig. 2. M. cayennensis, Linn.

26. MUSCICAPA MACULATA, Müller, Syst. Nat. Supp. p. 169, (1776.)
Muscicapa audax, Gm., Syst. Nat. i. p. 934, (1788.)
Myiodynastes maculatus, (Müller)! Buff., Pl. Enl. 453, fig. 2.

27. MUSCICAPA ATRA, Müller, Syst. Nat. Supp. p. 169, (1776.)
Muscicapa rufiventris, Gm., Syst. Nat. i. p. 941, (1788.) Buff., Pl. Enl. 572, fig. 3.

28. MUSCICAPA TYRANNULUS, Müller, Syst. Nat. Supp. p. 169, (1776.)
Muscicapa Aurora, Bodd., Tab. Pl. Enl. p. 34, (1783.)
Muscicapa ferox, Gm., Syst. Nat. i. p. 934, (1788.)
Myiarchus Tyrannulus, (Müller)! Buff., Pl. Enl. 571, fig. 1.

29. MUSCICAPA PURPURATA, Müller, Syst. Nat. Supp. p. 169, (1776.)
Muscicapa cruenta, Bodd., Tab. Pl. Enl. p. 23, (1783.)
Muscicapa rubricollis, Gm., Syst. Nat. i. p. 933, (1788.)
Querula purpurata, (Muller)! Buff., Pl. Enl. 381.

30. MUSCICAPA FUSCA, Müller, Syst. Nat. Supp. p. 170, (1776.)
Muscicapa fusca, Bodd., Tab. Pl. Enl. p. 33, (1783.) Buff., Pl. Enl. 568, fig. 2.
Muscicapa petechia, Gm., Syst. Nat. i. p. 948, (1788.)

31. Muscicapa spurca, Müller, Syst. Nat. Supp. p. 170, (1776.)
Buff., Pl. Enl. 567, fig. 1. Muscicapa senegalensis, Linn.

32. Muscicapa nitida, Müller, Syst. Nat. Supp. p. 170, (1776.)
Buff., Pl. Enl. 567, fig. 2. Held to be same as last.

33. MUSCICAPA CYANEA, Müller, Syst. Nat. Supp. p. 170, (1776.)
Muscicapa melanoptera, Gm., Syst. Nat. i. p. 939, (1788.) Buff., Pl. Enl. 567, fig. 3.

34. Muscicapa maculata, Müller, Syst. Nat. Supp. p. 171, (1776.)
Buff., Pl. Enl. 565, figs. 2, 3. M. atricapilla, Linn.
Prof. Müller uses this name twice. See above, No. 26.

35. MUSCICAPA CINEREA, Müller, Syst. Nat. Supp. p. 171, (1776.)
Muscicapa kinki, Bodd., Tab. Pl. Enl. p. 31, (1783.) Buff., Pl. Enl. 541.
Muscicapa cana, Gm., Syst. Nat. i. p. 940, (1788.)

36. MUSCICAPA VIRIDIS, Müller, Syst. Nat. Supp. p. 171,)1776.)
Muscicapa cristata, Gm., Syst. Nat. i. p. 938, (1788.) Buff., Pl. Enl. 573, fig. 2.

37. MUSCICAPA BOURBONNENSIS, Müller, Syst. Nat. Supp. p. 171, (1776.)
Muscicapa Borbonica, Gm., Syst. Nat. i. p. 939, (1788.) Buff., Pl. Enl. 573, fig. 1.

38. MUSCICAPA ARAUSIACA, Müller, Syst. Nat. Supp. p. 171, (1776.)
Muscicapa fusca, Bodd., Tab. Pl. Enl. p. 34, (1783.) Buff., Pl. Enl. 574, fig. 1.
Muscicapa fuliginosa, Gm., Syst. Nat. i. p. 932, (1788.)

39. MUSCICAPA FASCIATA, Müller, Syst. Nat. Supp. p. 172, (1776.)
Muscicapa nævia, Bodd., Tab. Pl. Enl. p. 34, (1783.) Buff., Pl. Enl. 574 fig. 3.
Muscicapa virgata, Gm., Syst. Nat. i. p. 948, (1788.)

40. MUSCICAPA PILEATA, Müller, Syst. Nat. Supp. p. 172, (1776.)
Muscicapa agilis, Gm., Syst. Nat. i. p. 948, (1788.) Buff., Pl. Enl. 574, fig. 2.
Muscicapa oliva, Bodd., Tab. Pl. Enl. p. 34, (1783.)

114. Genus MOTACILLA.

50. Motacilla boarula, Linn., Mant. p. 527, (1771.)

51. Motacilla caffra, Linn., Mant. p. 527, (1771.)

52. Motacilla maura, Pall., Trav. ii. p. 708, (1773.)

53. Motacilla cyanura, Pall., Trav. ii. p. 709, (1773.)

54. MOTACILLA GRISEA, Müller, Syst. Nat. Supp. p. 175, (1776.)
Edwards, Birds, pl. 259.
Motacilla sulphurea, Bechst., Naturg. Deuts. iii. p. 459, (1807.)

55. **Motacilla fusca**, Müller, Syst. Nat. Supp. p. 175, (1776.)
Motacilla chrysocephala, Gm., Syst. Nat. i. p. 971, (1788.) Buff., Pl. Enl. 58, fig. 3.
Motacilla aurantia, Bodd., Tab. Pl. Enl. p. 4, (1783.)

56. **Motacilla tricolora**, Müller, Syst. Nat. Supp. p. 175, (1776.)
Motacilla nigra, Bodd., Tab. Pl. Enl. p. 24, (1783.) Buff., Pl. Enl. 391, fig. 2.
Motacilla multicolor, Gm., Syst. Nat. i. p. 972, (1788.)

57. **Motacilla cristata**, Müller, Syst. Nat. Supp. p. 176, (1776.)
Motacilla galeata, Bodd., Tab. Pl. Enl. p. 24, (1783.) Buff., Pl. Enl. 391, fig. 1.
Motacilla cristata, Gm., Syst. Nat. i. p. 972, (1788.)

115. Genus PIPRA.

14. Pipra rubra, Müller, Syst. Nat. Supp. p. 177, (1776.)
Buff., Pl. Enl. 34, fig. 3. P. erythrocephala, Linn.

15. **Pipra melanocephala**, Müller, Syst. Nat. Supp. p. 177, (1776.)
Manacus gutturosus, Bonap., Consp. Av. i. p. 171, (1850.) Buff., Pl. Enl. 303, fig. 1.

16. Pipra plumata, Müller, Syst. Nat. Supp. p. 177, (1776.)
Buff. Pl. Enl. 303, fig. 2. Pipra pareola, Linn. (*juv.*)

116. Genus PARUS.

15. Parus erectus, Müller, Syst. Nat. Supp. p. 178, (1776.)
Buff., Pl. Enl. 3, fig. 2. P. cœruleus, Linn.

117. Genus HIRUNDO.

13. Hirundo daurica, Linn., Mant. p. 528, (1771.)

14. Hirundo alpestris, Pall., Trav. ii. p. 709, (1773.)

In the preceding list, I have not given, as entitled to consideration on account of priority, any names which are to be considered doubtful according to my present knowledge. At this particular time, I may be allowed to say, however, that I have various other authors in view for introduction to ornithological society, without being as yet quite sure what figure they will make, nor what established relations they may disturb.

In the "Deliciæ Naturæ Selectæ," Prof. Müller is associated with Georg Wolfgang Knorr, and the work is sometimes quoted as that of the latter named author. It is mainly a series of Illustrations in the various classes of Zoology; and many of them are excellent colored plates, especially those of Crustacea, Insects and Minerals. This work only relates to Ornithology in giving figures of the following species:

Pl. 1. Trochilus moschitus, Linn., Syst. Nat. i. p. 192, (1766.)
" mellisuga, Linn., Syst. Nat. i. p. 192, (1766.)
" ruber, Linn., Syst. Nat. i. p. 193, (1766.)
1, 1. Struthio Camelus, Linn., Syst. Nat. i. p. 265, (1766.)
1, 2. Diomedia demersa, Linn., Syst. Nat. i. p. 214, (1766.)
1, 3. Falco Gyrfalco, Linn. ?
1, 4. Buceros galeatus, Gm., Syst. Nat. i. p. 360, (1788.)
" ruficollis, Vieill., Nouv. Dict. iv. p. 600, (1816.)
1, 5. Paradisea regia, Linn., Syst. Nat. i. p. 166, (1766.)
1, 6. Ardea Grus, Linn., Syst. Nat. i. p. 234, (1766.)

November 1*st.*

MR. CASSIN in the Chair.

Fourteen members present.

Mr. Leslie exhibited specimens of limestone rock, containing fossil coral, charged with petroleum, from the base of the Devonian formation, near Lake Erie, western New York. He also exhibited a specimen of petroleum from the first well opened at Erie, Pa., on probably the same horizon as that of the former specimens. The oil was obtained at a depth of 750 feet.

November 8*th.*

Vice-President BRIDGES in the Chair.

Nine members present.

November 15*th.*

Vice President BRIDGES in the Chair.

Twelve members present.

A paper was presented for publication entitled "On a new Cormorant from the Farralone Islands, California." By J. G. Cooper, M. D.

November 22*d.*

Vice-President BRIDGES in the Chair.

Fifteen members present.

A paper was presented for publication entitled "Synopsis of the eastern American Sharks." By Theo. Gill.

November 29*th.*

Vice-President BRIDGES in the Chair.

Sixteen members present.

On report of the respective committees the following papers were ordered to be published:

Synopsis of the Eastern American SHARKS.

BY THEODORE GILL.

In the present article, I indicate the imperfection of our knowledge respecting the American Sharks, and have endeavored, as far as possible, with my limited materials, to rectify the synonymy. It will be perceived that I have connected names, proposed by Mitchill and others, with species belonging to different families from those to which they had been previously referred. No specific contradiction in the descriptions existing, and the diagnoses essentially agreeing with the species, it is probable that in such cases the generic relations of the species were *assumed* without verification of the generic characters. But when, as in the case of *Carcharias griseus** of Mr. Ayres, the generic position is not only assumed, but the characters *forced* to agree with it, tyros might be readily misled, and only knowledge of correlation of essential characters will enable the scientist to arrive at correct conclusions. As I have had the power of examining Odontaspidoids from the same neighborhood which agree, in family characters, with those species described by scientific naturalists, and which essentially agree in other respects with Mr. Ayres' description, I identify them with his species without hesitation, although I cannot adopt the name, since it had received two others previously. I may add that its true relations have been appreciated by both Messrs. Desor and Storer.

As already intimated, this contribution must be considered rather as an exposition of our present ignorance of the species, than the embodiment of the correct nomenclature. It is not too much to say that the titles of half the species to their names require to be confirmed. Although I have seen more or less of most of these species, the want of opportunity to compare them with others, and the critical nature of the characters distinctive of species in this order, forbid the idea of correctness in every instance. As, however, much good may often be done by the mere exposition of our deficiencies, this article is submitted with the hope that it may at least excite investigation.

The synonymy of the American forms is alone introduced.

I. Pectoral fin with the base entire in front...................... SQUALI.
    A. Anal fin present.
        α. Caudal lunate; *tail keeled on one side*................ LAMNOIDÆ.
        αα. Caudal with the upper lobe much elongated.
            β. Branchial apertures entirely in front of pectorals.. ODONTASPIDOIDÆ.
            ββ. Branchial aperture behind above pectoral.
                γ. Caudal exceedingly long. Eyes without nictitant membrane.................. ALOPECOIDÆ.
                γγ. Caudal moderately elongated. Eyes with nictitant membrane.
                    Head laterally produced..................... CESTRACIONTOIDÆ.
                    Head normally formed .... GALEORHINOIDÆ.
    AA. Anal fin obsolete.
        Dorsals each armed in front with spine............ SPINACOIDÆ.
        Dorsals unarmed.. SCYMNOIDÆ.
II. Pectoral fin with with the base cleft in front............... RHINÆ.
RHINOIDÆ.

LAMNOIDÆ, Müll. and Henle.

CETORHININÆ Gill.

CETORHINUS Blainv.

Tetroras *Raf.*, 1810 (desc. and name erroneous.)
Selache *Cuv.*, 1817.
Sèlachus *Yarrell.*

CETORHINUS MAXIMUS Blainv.

Squalus maximus (L.) *Fab.*, F. G. 130. *Mit.*, Tr. N. Y. i. 486.
Squalus elephas *Des.*, Journ. Ac. ii. 350.
Squalus rhinoceros *Mit.*, 1828 (fide DeKay.)
Squalus (Selache) maximus *Rich.*, F. B. iii. 291.
Squalus (Selache) elephas *Storer*, Rep. 407.

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* The figure of this species, like the description, is thoroughly unreliable; it is better, however, than that of the *Myliobatis bispinosus*, in which more attention appears to have been paid to the delineation of mathematical figures and lines than to the representation of nature.
(See Boston Journal N. H., iv., pl. 18.)

Selachus maximus *DeKay*, N. Y. F. iv. 357 ; *St.* Syn. 254.

Hab. Am. Greenland to New Jersey.

If there is any actual difference between the American and European representatives of this genus, they have not yet been pointed out; the example of previous authors in referring both to *C. maximus* is, therefore, still followed. The synonymy of the American fish is alone given.

ISURINÆ Gill.

CARCHARODON A. Smith.

Carcharias obscurus *Storer*. Bn. Journ. ii. 558, (excl. syn.)

Carcharias Atwoodi *Storer*, Bn. Proc. 1848, p. 72.

" The first dorsal fin is *one foot* in length."

" The second dorsal is *one inch* long." " The anal fin is *one inch* long."

"The upper lobe of the caudal fin measures *two feet* over its curvature ; the lower lobe measures *one foot and a half.*"

These measurements of the fish, called by Dr. Storer *C. obscurus*, are *incompatible* with *any form* of the family of Galeorhinoidæ; the description is *only reconcilable with Carcharodon.* I had, however, at one time supposed that it might be referrible to *Eulamia*,* the notice of the dentition, except as to number of teeth $(\frac{16}{16})$ in which it agrees with no shark, being vaguely applicable.

The *Carcharias Atwoodi* is also probably the same species, the anal being said to be far behind the second dorsal, and thus distinguished from the " white shark." Dr. Storer doubtless obtained his idea of the latter from Yarrell's copy of Belon's figure, which erroneously represents a *Carcharodon* with the anal opposed to that fin.

Having been shown a tooth of a *Galeocerdo*, said to have been taken from *C. Atwoodi*, I have asked whether that species could have belonged to that genus, but the *position of the anal* and the *triangular teeth* forbid such identification.

ISUROPSIS Gill.

Isuropsis glaucus, Gill.

Lamna punctata *Storer*, Boston Journ. ii. 534. Rep. 185, pl. 3, fig. 2.

Not *Squalus punctatus Mitch.*†

Oxyrhina Dekayi *Gill*, Cat. 60.

Isuropsis Dekayi *Gill*, Squali, 43. An. Lyc. N. Y. viii. 153.

Hab. Mass.; New York.

This species of the eastern coast is probably identical with *Isuropsis glaucus*, said by Müller and Henle to be a native of Java. As it has not, however, been found there by the indefatigable Bleeker, and has been eliminated from the recent enumeration of the species of the Archipelago, it is probable that such *habitat* is erroneous, and that the specimen described was obtained from Surinam. Prof. Poey has found apparently the same species at Cuba.

ODONTASPIDOIDÆ Gill.

EUGOMPHODUS Gill.‡

Eugomphodus littoralis, Gill.

Squalus americanus *Mit.*, Trans. N. Y. i. 483 (not Shaw.)

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* The *Carcharias obscurus* (Storer) must be considered under two heads:

1st. The fish mentioned in the report, which is a species of *Carcharodon*.

2d. Another individual identified by Dr. Storer with *Carcharias obscurus*, and dissected by Dr. Wyman, whose description (Boston Proc. iv. 123; 1851) of its viscera, &c., indicates that it belonged to the *Galeorhini*. The specimen examined by that accomplished anatomist was doubtless the *Eulamia Milberti*, and consequently related to the true *Carcharias obscurus*.

† "The caudal fin *very unequally divided*, the upper section being almost *thrice as large as the lower*. and having a process on the lower side." *Mitch.* Trans. N. Y. i. 485.

‡ *Eugomphodus* is distinguished from *Carcharias* (Raf.,) *Triglochis* or *Odontaspis* by the simple first and fourth teeth of the upper jaw, as well as the first of the lower. The more anterior dorsals also separate it from *O. taurus*.

Squalus littoralis *Mit.*, Am. Monthly Mag. &c. ii. 328.
Squalus macrodus *Mit.*, op. cit. ii. 328.
Carcharias littoralis *DeKay*, iv. 351.
Carcharias griseus *Ayres*, Boston Journ. iv. 293.
Odontaspis griseus *Desor*, Bost. Proc. ii. 264.
Eugomphodus griseus *Gill*, Cat. 60.
Odontaspis americanus *Abbot*, Proc. Ac. N. S.
Eugomphodus littoralis *Gill*, op. cit. 1863, 333.
Hab. Mass. to New Jersey.

ALOPECOIDÆ.

ALOPIAS Raf.

Alopias vulpes, Bon.

Thresher or long tailed Shark *Mitch.*, Med. Rep. 2d hex., ii. 77.
Squalus vulpes (L.) *Mitch.*
Carcharias vulpes DeK., iv. 348.
Alopias vulpes *Storer*, Syn. 253.
Hab. Mass. southwards.

CESTRACIONTOIDÆ.

CESTRACION Klein.

Sphyrna *Raf.*, 1810.
Sphyrnias *Raf.*, 1815.
Cestrorhinus *Blainv.*, 1816.
Zygæna *Cuv.*, 1817.
Platysqualus *Sw.*, 1839.
Sphyra *Vanderhoeven.*

Cestracion zygæna, Gill.

Squalus zygæna *L. Mitch.*, Trans. N. Y. i. 482.
Zygæna malleus *Cuv.*
Sphyrna zygæna *M. and H.*
Sphyrnias zygæna *Gray.*
Zygæna subarcuatus *Storer.*
Cestracion subarcuatus *Gill*, Cat.
Cestracion zygæna *Gill*, Squali.
Hab. Eastern coast generally.

RENICEPS Gill.

Reniceps tiburo Gill.

Squalus tiburo *Linn.*
Cestrorhinus tiburo *Blainv.*
Zygæna tiburo *Val.*
Sphyrna tiburo *M. and H.*
Sphyrnias tiburo *Gray.*
Cestracion tiburo *Gill*, Cat.
Reniceps tiburo *Gill*, Squali.
Hab. New York southwards.

GALEORHINOIDÆ Gill.

GALEORHININÆ Gill.

GALEORHINI.

EULAMIA Gill.

Carcharias *Cuv.*, (not Raf.)

EULAMIA MILBERTI Gill.

Squalus carcharias *Mit.*
Carcharias (Prionodon) Milberti (*Val.*) M. and H. 38.
Carcharias cæruleus *DeKay*, 349, pl. 61, f. 200.
Lamna caudata *DeKay*, 354, pl. 62, f. 205.
Squalus (Carcharinus) caudata *Gray*, 44 (excl. syn.)
Squalus (Carcharinus cæruleus *Gray*, 44.
Squalus (Carcharinus) Milberti *Gray* 45.
Squalus Milberti *Gill*, Cat 59.
Squalus cæruleus *Gill*, Cat. 59.
Eulamia Milberti *Gill*, Squali 44.

The specific name here adopted was applied in MSS. by Valenciennes to a specimen sent from New York by Milbert, and was retained for a species to which that specimen, one from Leyden and one in the Museum of Berlin, obtained by Hemprich and Ehrenberg, were referred. The specimen on which the description and measurements were especially based is not specified. The description agrees quite well with the *Carcharias cæruleus* of DeKay.

The *Carcharias cæruleus* was established on a young female, and the *Lamna caudata* on the figure of an adult female obtained from Mr. Brevoort, to whom I have been indebted for the information.

That gentleman has shown to me the original drawing of which DeKay's figure was a professed copy. It is drawn with Mr. Brevoort's wonted accuracy, and distinctly represents the last branchial apertures above the pectoral fins ; the species is, therefore, a true *Eulamia*, as its form indicates, and as was suspected by Dr. Gray.

With the European form, Nardo has identified his *Squalus plumbeus* as well as the *S. Cæcchia* of Chiereghin.

PLATYPODON Gill.

PLATYPODON OBSCURUS Gill.

Squalus obscurus *Les.*
Carcharias obscurus *Dekay*, (not Storer.)
Carcharias (Prionodon) obscurus *M.* and *H.*
Squalus (Carcharinus) obscurus *Gray*.

Messrs. Putnam and Nason have favored me with notices and partial figures of a shark taken on the coast, and preserved in the Museum of Williamstown College, which appeared to apply to this species. It is scarcely necessary to remark, that the teeth, represented by Lesueur, have been reversed, the wider one belonging to the upper and the narrow to the lower jaw.

APRIONODON Gill.

APRIONODON PUNCTATUS Gill.

Squalus punctatus *Mitch.* Trans. N. Y. i. 484.
Carcharias (Aprion) isodon (*Val.*) *M.* and *H.*, 32.
Squalus (Aprion) isodon *Gray*, 43.
Aprionodon punctatus *Gill*, Cat.

Hab.—New York.

"Iris, oblong and vertical.

"Teeth small, *triangular* and *without jagged edges.*

"First dorsal —— situated about the middle of the back. The second dorsal membranous, somewhat adipose, and of a *rhomboidal* figure. ——— An anal fin corresponding (opposite) to the second dorsal.

"The caudal fin very unequally divided ; the *upper section* being almost *thrice as large as the lower*, and having a process on the lower side." (Mitchill.)

The *Squalus punctatus*, therefore, cannot be a species of *Lamna* as long supposed, nor yet a species of *Eulamia*, *Platypodon*, or even *Scoliodon*, with which, among known American species, it can alone have affinities.

The habitat of *C. isodon* has not been specified; but as the specimen on which it was founded was sent by Mr. Milbert, it was probably obtained at New York.

SCOLIODON M. and H.

Scoliodon terræ-novæ Gill.

Squalus (Carcharias) terræ-novæ *Rich.*
Scoliodon terra-novæ *Gill,* Cat.
Hab.—Newfoundland and New York.

As already indicated by Müller and Henle, (p. 189), the *S. terræ-novæ* of Richardson evidently belongs to the genus *Scoliodon* as now understood, and has no affinity with *Lamna* to which it has been referred by several authors.*

GALEOCERDO M. and H.

Boreogaleus *Gill.*

Galeocerdo tigrinus M and H.

Galeus maculatus *Ranz.*

To this species I refer two jaws, said to have been obtained on the eastern coast, and others from the West Indies, Lower California and the Western Pacific. The jaws are from adult fishes, and resemble in the form of the teeth the *G. arcticus.*

Müller and Henle distinguish two species of *Galeocerdo.*

G. tigrinus with, 1, a moderate flat snout; 2, teeth $\frac{25}{25}$, coarsely serrate, and the unpaired one little bent, and with an entire terminal point; 3, elongated caudal; 4, spotted body; 5, last two branchial apertures above the pectorals; 6, anal fin, with the anterior lobe little produced and rounded.

G. arcticus with, 1, a very short snout; 2, teeth $\frac{23}{23}$, finely crenulated, the unpaired teeth curved and crenulated throughout; 3, caudal moderate; 4, immaculate body; 5, *fifth* branchial aperture *only* above the pectorals; 6, anal with its anterior lobe much produced and pointed.

Placing an undue value on these differences, I formerly proposed to generically distinguish *G. arcticus.*

To Prof. Poey I am indebted for the figure of an adult *Galeocerdo*, exhibiting the gills and anal fin of *G. tigrinus*, but the form and teeth of *G. arcticus;* he believes that his fish is only the adult form of *G. tigrinus*, and I am obliged to agree with him in this view. The body, and especially the caudal and snout, became abbreviated with age, and the teeth change. The jaws seen by me exhibit variations in number from 21 to 23, but none $\frac{25}{25}$. Can the latter formula be the result of a typographical error?

MUSTELINÆ Bon.

MUSTELUS Cuv.

Mustelus canis Dekay.

Squalus canis *Mitch.* Trans. N. Y. i. 486.
Mustelus canis *Dekay.*
Hab.—Eastern coast.

SPINACOIDÆ Owen.

SQUALUS *Art.* Raf.

Squalus americanus Gill.

Squalus acanthias *Mitch.* (vix auct.)

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* The *S. terræ-novæ* and *Lamna punctata* (*Aprionodon*)—Galeorhinoids—have been regarded as identical and belonging to the genus *Lamna.*

Spinax acanthias? *Dekay.*
Acanthias americanus *St.* Syn. 254.
Squalus americanus *Gill*, Proc. Acad. 1862.
Hab.—Eastern coast generally.

CENTROSCYLLIUM M. and H.

CENTROSCYLLIUM FABRICII M. and H.

Squalus acanthias *Fab.* (not L.)
Spinax Fabricii *Reinh.*
Centroscyllium Fabricii *M.* and *H.* Plag.
Hab.—Greenland.

*SCYMNOIDÆ** Owen.

SOMNIOSUS Les.

SOMNIOSUS MICROCEPHALUS Gill.

Squalus microcephalus *Bl. Schn.* 135.
Squalus borealis *Scoresby*, i. 358; xv. 3, 4.
Scymnus borealis *Fleming*, 166.
Squalus (Scymnus) glacialis *Faber*, 23.
Scymnus micropterus *Val.* Nouv. Mem. i. 455, pl. xx.
Squalus norwegianus *Blainv*, F. Fr. 61.
Scymnus (Læmargus) borealis, *M.* and *H.* 93.
Dalatias (Somniosus) borealis *Gray*, 76.
Somniosus microcephalus *Gill*, Cat.
Somniosus brevipinna *Les.*
Scymnus brevipinna *Dekay.*
Leiodon echinatus *Wood.*
Hab.—Greenland to Cape Cod.

It is probable, as indicated in my catalogue, that the *S. brevipinna* is not distinct from *S. microcephalus.*

RHINOIDÆ Gill.

RHINA Klein.

RHINA DUMERILI Gill.

Squativa Dumeril *Lesueur.*
Rhina Dumerili *Gill*, Cat.
Hab.—New York?

Genus PLATYPODON Gill.

Synonymy.

=Platypodon *Gill*, Analytical Synopsis of the order of Squali, p. 35; in Annals of the Lyceum of Nat. Hist. of New York, vol. viii. p. 401, 1861.
Carcharias (Prionodon), sp. *Müller* and *Henle.*
Squalus (Prionodon), sp. *Poey.*
Isoplagiodon, sp. *Gill.*

Body slender and fusiform in profile, tapering behind.

Scales tricuspid, surmounted by three keels terminating with the cusps.

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* The family Scymnoidæ is represented by five distinct genera.

1. Scymnus.
2. Isistius (*Scymnus brasiliensis* M. and H.) distinguished by its similar and posterior dorsals, &c.
3. Somniosus.
4. Euprotomicrus (*Scymnus Labordii* M and H.) with teeth like *Somniosus*, but in moderate number (c. 23) and very small first dorsal.
5. Rhinoscymnus (*Scymnus rostratus* Risso) distinguished by its dorsals, &c.

Head oblong, with the snout produced, oblong, gradually narrowed, and with its periphery convex. *Eyes* moderate, with the pupil vertical. *Nostrils* nearer the front of the mouth than the snout, nearly rectangular to mouth, with the anterior flap small and near the inner angle.

Mouth moderate, but convex in front, and wider than deep.

Teeth of upper and lower jaws dissimilar; of each jaw mostly similar, but smaller and more oblique towards the corners of the mouth; two symmetrical front ones in upper, an unpaired one in lower jaw; the two front teeth of the *upper* jaw inclined towards each other; the rest serrated, oblique, rectilinear or nearly so along the inner edge, and with an obtusely angled emargination at the outer edge, the lower branch of which forms the so-called heel. *Lower jaw* with a small azygous erect tooth at symphisis; the rest with broad bases and narrow oblique entire or weakly crenulated cusps, inclining more as they recede from the symphisis.

Branchial apertures moderate; the fourth, typically, nearly above the outer base of the pectoral fin.

Dorsal fins dissimilar; the *first* nearly midway between the pectoral and ventral fins, or little nearer the former, moderate, obtusely produced at the anterior angle, and acutely prolonged at the posterior; the *second* small, narrow, produced acutely from the posterior angle.

Anal fin nearly opposite the second dorsal, slightly larger than the latter, obtusely enlarged at the anterior angle, acutely produced at the posterior.

Caudal fin above with a pit at base, normally prolonged, and with a moderate lower lobe, narrow towards its rounded apex.

Pectoral fins moderate, but narrowed towards the rounded point, with the inner angle little produced.

Ventral fins moderate, rhomboidal.

Type.—Platypodon menisorrah *Gill.*

Syn.—Carcharias (Prionodon) menisorrah *Müller* and *Henle.*

This genus was first named in the "Analytical Synopsis of the Order of Squali," but no diagnosis was there given. *Platypodon* differs from *Isoplagiodon* in the dissimilarity of the teeth of the two jaws, the two paired teeth of the front jaw, and, perhaps, in the form of the mouth and narrower caudal portion of the tail. *Squalus tiburo* Poey, *S. acronotus* P. and *S. obscurus* Les., belong to it.

Notes of an Examination of the Birds of the Subfamily COEREBINÆ.

BY JOHN CASSIN.

1. Genus COEREBA, Vieillot.

Coereba, Vieill., Ois. d'Am. Sept. ii. p. 70 (1807).
Arbelorhina, Cab., Schomb. Reisen iii. p. 675 (1848).

This name is now almost universally applied to the group for which I use it in this paper, and of which the bird described by Linnæus as *Certhia cyanea* may be presumed to be the type. Vieillot, as above cited, evidently adopts it as a name for a group which he regarded as a genus, intending to include that species (*C. cyanea*) to which the name *Guira-coereba Brasiliensibus* had been previously given by Marcgrave and Piso in Nat. Hist. Brasil, p. 212. It was not the usage of Vieillot nor of numerous other binomial authors, including Linnæus, to assume any one species as the type of a proposed or adopted genus, and in my opinion there is a very considerable degree of impropriety, as well as injustice, in ascribing to those authors any other than their real and palpable intentions. For genera, the names of which are adopted from other authors and the same groups intended to be designated, those authors, whether *ante-Linnæan* or other non-binomial, (or any other,) ought to be consulted and the types ascertained in that manner, whenever it becomes necessary.

It will be found on reference to Ois. d'Am., Sept., as cited above, that the only species of his genus *Coereba* given by Vieillot is *Coereba flaveola*, supposed to be the same as *Certhia flaveola*, Linnæus. According to the views of some distinguished and judicious authors, that species should be regardsd as the type of the genus, and the name *Coereba* should therefore be applied to a group since designated, and now well known as *Certhiola*. In such view, I cannot coincide.

Dr. Cabanis, as above, proposes the name *Arbelorhina* as a substitute for *Coereba*, apparently objecting to the barbarous origin of the latter. His type is *C. cyanea.*

1. **Coereba cyanea**, (Linnæus.)
Certhia cyanea, Linn., Syst. Nat. i. p. 188 (1766).
Certhia flavipes, Gm., Syst. Nat. i. p. 472 (1788).
Certhia cyanogastra, Lath., Ind. Orn. i. p. 295 (1790).
Certhia armillata, Sparrm., Mus. Carls., No. 36 (1787).
Coereba carneipes, Sclater., Proc. Zool. Soc., London, 1859, p. 376. ?
Arbelorhina brevipes et eximia, Cab., Mus. Hein. i. p. 96 (1850). ?

Aud. and Vieill., Ois. Dor. ii. pl, 41, 42, 43. Vieill., Gal. i. pl. 176. Sparrm., Mus. Carls., pl. 36. Buff., Pl. Enl. 83, fig. 2. Edwards' Birds, vi. pl. 264, fig. 1. Hahn., Voegel. pt. xii. pl. 3. Reich., Voeg. fig. 3767, 3768, 3769.

Numerous specimens of this species are in the Museum of the Academy, variously labelled Cayenne, Brazil, Trinidad, Venezuela, and Nicaragua, of which localities I know several to be correct. There is appreciable difference between them in the size and degree of curve in the bills, but all are exceedingly alike in colors. Specimens from Venezuela have the largest bills, and it happens also that one specimen in the Massena collection, marked "Caraccas," in the hand-writing of M. Victor Massena, has the smallest. These large-billed specimens from Venezuela may be entitled to specific distinction, and, in addition to their larger size, seem to have with some uniformity a greater extent of the black of the lores, completely enclosing the eye and extending behind it. A specimen from Panama, belonging to the Smithsonian Institution, has the same character, but is smaller in all its parts. The Mexican and Central American bird may also be distinct, and entitled to the name given by Dr. Sclater, as above cited, but probably not on account of having the legs red. I suspect that the adult bird always has the legs of that color, in whatever locality; and. in a very interesting and valuable paper on the birds of the West Indies, Mr. E. Cavendish Taylor says of the bird found in Trinidad: "Its legs and feet are bright red." (Ibis, 1864, p. 81).

There are at present fourteen mounted specimens of this species in the Academy Museum, and numerous others in skins, not exhibited. Notwithstanding the small differences in specimens, as above, I find it impossible to distinguish Dr. Cabanis' species *brevipes* and *eximia* in the collection.

2. **Coereba cærulea** (Linnæus).
Certhia cærulea, Linn., Syst. Nat., i. p. 118 (1758).
Certhia ochrochlora, Gm., Syst. Nat., i. p. 472 (1788).
Certhia surinamensis, Lath., Ind. Orn., i. p. 295 (1790).
Fringilla cyanomelas, Gm., Syst. Nat., ii. p. 924 (1788).

Aud. et Vieill., Ois. Dor., ii. pl. 44, 45. Edwards' Birds, i. pl. 21, fig. 1. Sparrm., Mus. Carls., pl. 82. Hahn's Voeg., pt. xii. pl. 4. Reich. Voeg., fig. 3770, 3771.

Six specimens, nearly all of which are labelled "Cayenne." For this species I take specimens with a medium-sized bill, as nearly as possible like the figure in Edwards' Birds, above cited, on which this species is founded.

3. **Coereba longirostris**, (Cabanis).
Arbelorhina longirostris, Cab., Mus. Hein., p. 96 (1851).
Coereba trinitatis, Bonap., Compt. Rend., 1854, p. 258.

Seven specimens, all labelled "Trinidad" and "Caraccas," and strongly characterised by their long and stout bills. The females seem to have the throat more clearly ochre-yellow than in those of other species, and perhaps the longitudinal stripes on the under surface of the body wider and less numerous. The Prince Bonaparte cites "Sparrm., Mus. Carls., pl. 80," as possibly this species; but evidently erroneously, as that plate (Mus. Carls., pl. 80,) represents the very smallest of Sparrmann's proposed species.

4. **Coereba brevirostris**, (Cabanis).
Arbelorhina brevirostris, Cab., Mus. Hein., p. 96.

Four specimens, labelled "Bogota," "Guayaquil," and "Cayenne." That from Guayaquil may be distinct, and seems to have the black gular patch narrower; the black space on the lores seems to be larger, and the light blue of the forehead ends in a sharp angle at the base of the bill.

5. **Coereba nitida**, Hartlaub.
Coereba nitida, Hartl., Rev. Zool., 1847, p. 84.
Jard. Orn. Contr., 1850, pl. 66, fig. 1. Reich. Voeg., fig. 3772.

Five specimens, differing in size somewhat, but very similar in plumage. One specimen, which is the original of the figure in Jardine's Contributions, cited above, is labelled "Upper Amazon;" two others are labelled "Guayaquil," and two are from Peru, presented by Hon. John Randolph Clay, late U. S. Minister to that Republic.

One specimen from Guayaquil, and the specimens from Peru, are very considerably the largest,—quite sufficiently so to be regarded as distinct, on the terms which seem to prevail in this genus. The specimen figured as above is the smallest, though apparently quite adult. The figure alluded to is a mere caricature; the wing too long, the tail too short, and the transverse black bars awkwardly attempted to be shown on the abdomen are purely imaginary, there being no such in the specimen.

♀. Entire upper parts green, rather lighter than in the female of *C. coerulea* and *C. longirostris*. Under parts dull white, strongly tinged with ochre yellow on the throat and breast and under tail coverts; longitudinally striped with green on the sides and abdomen. Wing brownish black, all the quills widely edged with green; tail brownish-black, two middle feathers green, and all the other feathers widely edged, and tipped with green. Bill dark; legs light colored.

6. **Coereba lucida**, Sclater.
Coereba lucida, Sclat., Ibis, 1859, p. 14.

Strictly of the same general form as the preceding, but singularly different in color, and in all respects as described by Dr. Sclater, as above cited. Specimens in the Museum of the Smithsonian Institution from Panama.

2. Genus CHLOROPHANES, Reichenbach, Handb. Spec. Orn. pt. v. p. 233, (1853.)

1. **Chlorophanes spiza**, (Linnæus.)
Motacilla Spiza, Linn. Syst. Nat. i. p. 188, (1758.)
Coereba atricapilla, Vieill., Nouv. Dict. xiv. p. 50, (1817.)
Turdus micans, Hahn, Voegel aus Asien, &c., pt. iii. (1819.)
Nectarinia mitrata, Licht. Verz. p. 15, (1823.)
"Coereba melanocephala, Vieill." DeWeid, Beitr. Naturg. Bras. iii. p. 771, (1831.)
Chlorophanes guatemalensis, Sclat. Proc. Zool. Soc. London, 1861, p. 129.
Edwards' Birds i., pl. 25, pl. 348. Hahn's Voegel, pt. iii. pl. 1. Buff. Pl.

Enl. 578, fig. 2, 682, fig. 1. Merrem. Icon. Av., pl. 5. Aud. & Vieill. Ois. dor. ii. pl. 47, 48, 49. Reich. Voeg., fig. 3746, 3747.

Eighteen mounted specimens in Acad. Mus. Of this apparently abundant and widely diffused species, there are four varieties in the specimens before me, which, though I cannot at present regard them as species, appear to be well marked, and may be sufficiently constant and perhaps local, to be entitled to specific distinction. On this view of specific identity, the names above are given as synonymes, the first name being that of Linnæus, in the tenth edition of Systema Naturæ, in which the species is founded on Edwards' plate 25, fig. 1, and no other authority cited, except fig. 2 of the same plate, which is given as a variety. In the twelfth edition, the name *Spiza* is continued, and the tenth edition cited, Brisson being cited only as an additional synomyme. This species is in nowise founded on either Brisson's description nor on Seba's figure, and consequently the remarks of several distinguished ornithologists, and the adoption by them of Vieillot's name *atricapillus* are not correct. I distinguish the following varieties:

a. C. SPIZA, (Linnæus.) Edwards' Birds i., pl. 25.

Very nearly of the size given by Edwards in the plate cited, and smaller than *C. guatemalensis*, Sclater. The black of the head extending to the occiput, wings and tail brownish black, the feathers of the latter and quills edged externally with green. All other parts of the plumage fine lustrous yellowish green, occasionally with a bluish gloss in some lights. Total length, about 5¼ inches. "Cayenne," "Trinidad."

b. C. GUATEMALENSIS, Sclater.

Larger than the preceding, and with the black of the head extending more fully upon the occiput. The green of the plumage of a lighter shade. Total length, about 5¾ inches. Guatemala, "Nicaragua," Mexico.

c. C. CÆRULESCENS, nobis. Aud. & Vieill. Ois. Dor. pl. 47 ?

Quite as large as *C. guatemalensis*, and with the black of the head having about the same extent. All the plumage (except the black parts) bluish green, especially to be observed on the under parts of the body. In all other varieties the fine lustrous green of the plumage changes to blue in a limited degree, but in this variety the blue color appears to be constant, and changes to green in some exposures to the light. Total length about 5½ inches. Specimens in the Acad. Mus. are from M. D'Orbigny's collection, and are labelled, in the handwriting of M. Victor Massena, "C. Spiza ? No. 149, D'Orbigny, Juracares, Bolivia."

d. C. MELANOPS, nobis.

Smaller than either of the two varieties immediately preceding, and about the size, or rather smaller than the first variety here given (*C. Spiza*). Black of the head much restricted, and extending about half way only between the front and occiput, or but little beyond the eyes. Green feathers of the occiput and back of the neck having a strongly defined or scale-like character. Green parts of the plumage much as in the variety *C. Spiza*, but with the green edges of the quills and tail feathers wider and more clearly defined. Total length about five inches. Two specimens, ♂ and ♀, in Acad. Mus., labelled in Europe, in a handwriting that I do not recognize: "2873, 3045, Certhia Spiza ? Rio Negro, Ameriq. Mérid."

3. Genus DACNIS, Cuvier, Reg. An., i. p. 395 (1817).

Of this genus I have seen the following species:

A. *Cyanodacnis.*

1. DACNIS CAYANA, (Linnæus).

Motacilla cayana, Linn., Syst. Nat., i. p. 336 (1766).

Motacilla cyanocephala, Gm., Syst. Nat., i. p. 990 (1788).
Dacnis cyanater, Less., Tr. d'Orn., i. p. 458 (1831). Puch., Rev. et Mag. Zool., 1854, p. 70.
Briss. Orn., iii. pl. 28, fig. 1, 4. Buff., Pl. Enl., 578, fig. 1. Sw., Zool. Ill., ii. pl. 117.

Under this name I place numerous specimens of a common Brazilian species, the males of which are clearly the bird figured by Swainson, as above cited. It is not so clear to me, however, that they are precisely that figured and described by either Brisson or Buffon. The former is the authority for the species *Motacilla cayana*, Linn. (Briss. Orn., iii. p. 534), and I am not without a suspicion that either a smaller species, next following in this paper, or that *D. coerebicolor*, Sclater, is entitled to this name. The description by Lesson is short, and applicable to both species, but relying on the locality given by him, "Bresil," it is possible that his name, *D. cyanater*, is the proper designation for the present bird.

This species is larger than that immediately following, and has the black space on the back larger. It is well represented in Swainson's plate, cited above, and is commonly brought in collections from Bahia and other localities in Southern Brazil.

2. **Dacnis nigripes**, Pelzeln?
Dacnis nigripes, Pelzeln, Sitzungb. Akad. Vienna, 1856, p. 155?
Nectarinia bicolor, Becklemichew, Acta Akad. Moscow, vii. p. 378 (1828)?
Edwards' Birds, vi. pl. 263. Beckl., Nouv. Mem. Acad. Moscow, vii. pl. 23? Pelz. Sitzungb. Akad. Vienna, 1856, pl. 1, fig. 1.?

This is, in my opinion, a species distinct from the preceding, though resembling it in colors. It is smaller, and has the black space on the back smaller and more strictly defined. It is figured by Edwards, as above cited, and also seems to be the bird given by Becklemichew, whose name I should be inclined to adopt, were it not anticipated by Vieillot, for the species of this genus usually given as *Dacnis plumbea*, (Latham). It may also be the species described and figured by that excellent ornithologist, M. Pelzeln, as above cited, but the legs in dried specimens are not black. Ten specimens in the Academy Museum I regard as this species. They are labelled as from Cayenne and Northern Brazil.

3. **Dacnis ultramarina**, Lawrence.
Dacnis ultramarina, Lawr., Proc. Acad., Phila., 1864, p. 106.

From the Isthmus of Panama. This is another species of the same group as the two preceding, and resembling them in colors. It is, however, of a different and deeper blue color, and has the black of the throat distinctly tinged with green. It is described, and its peculiar specific characters are stated with his usual precision and judgment by Mr. Lawrence, as cited above.

B. *Polidacnis.*

3. **Dacnis melanotis**, Strickland.
Dacnis melanotis, Strickl., Jard. Contr. Orn., 1851, p. 16.
"Dacnis angelica, De Filippi," Bonap., Comp. Av., i. p. 400? Sclater, Ibis, 1863, p. 315?
Buff., Pl. Enl., 669, fig. 2. Vieill., Gal., i. pl. 165. Buff., Pl. Enl., 669, fig. 1? Reich., Voeg., fig. 3740.

Ten specimens, labelled "Cayenne" and "Rio Negro."

5. **Dacnis venusta**, Lawrence.
Dacnis venusta, Lawr., Ann. Lyc., N. Y., 1862, p. 464.
Sclater's Ibis, 1863, pl. 7.

A beautiful species, of which the only specimens that I have seen are the types (male and female) in the collection of Mr. Lawrence, kindly lent to me for examination by that gentleman. It is a strongly characterized species, not intimately resembling any other at present known, and easily recognized by its scarlet *tibiæ*, which is quite a peculiar and curious character in this group. From Panama, very handsomely figured in the Ibis, as above.

4. DACNIS EGREGIA, Sclater.
Dacnis egregia, Sclat., Proc. Zool. Soc., London, 1854, p. 251.
Sclater, Cat. Am. Birds, pl. 7.

One specimen, labelled "Columbie." A beautiful little species, of which both sexes are very handsomely figured by Dr. Sclater, as above.

5. DACNIS COEREBICOLOR, Sclater.
Dacnis coerebicolor, Sclat., Jard. Contr. Orn., 1851, p. 106.
Jard. Contr. Orn., 1852, pl. 93, fig. 2.

Three specimens, labelled "Bogota."

C. *Eudacnis.*

6. DACNIS FLAVIVENTRIS, D'Orbigny et Lafresnaye.
Dacnis flaviventris, D'Orb. et Lafr., Mag. Zool., 1837, p. 31.
D'Orb., Voy. Am. Ois., pl. 13, fig. 2. Reich., Voeg., fig. 3749.

Two specimens, one of which is labelled "Peru," and the other "Upper Amazon."

7. DACNIS PULCHERRIMA, Sclater.
Dacnis pulcherrima, Sclat., Rev. Zool., 1853, p. 479.
Nemosia torquata, Du Bus, Bull. Acad. Brux., xxii. p. 155 (1855).
Sclater, Cat. Am. Birds, pl. 8.

One specimen. This bird is, in my opinion, but doubtfully of this genus, and possibly more nearly allied to *Nemosia.*

D. *Ateleodacnis.*

8. DACNIS LEUCOGENYS, Lafresnaye.
Dacnis leucogenys, Lafr., Rev. Zool., 1852, p. 470.

One specimen from Venezuela. A curious little species, easily recognized by its white ears and white upper tail coverts, though apparently little known to naturalists.

9. DACNIS SPECIOSA, (De Wied).
Sylvia speciosa, De Wied, Beitr., iii. p. 708 (1831).
Dacnis analis, D'Orb. et Lafres., Mag. Zool., 1837, p. 21.
Temm., Pl. Col. 293, fig. 2. Jard. Contr. Orn., 1852, pl. 93, fig. 1.

Four specimens, three of which are labelled as from Brazil. One specimen (Massena Coll., No. 2-776,) may not be this species, though nearly allied. It is darker colored, especially on the head and under parts of the body; the latter character being particularly observable. It is without label stating locality. This specimen is sufficiently dark-colored to resemble the preceding (*D. leucogenys*), but has not the white ears and white upper tail coverts of that species. Under tail coverts dark chestnut.

10. DACNIS BICOLOR, (Vieillot).
Sylvia bicolor, Vieill., Ois. d'Am., Sept., ii. p. 32 (1807).
Sylvia cærulescens, De Wied, Bestr., iii. p. 713 (1831).
Sylvia plumbea, Lath., Ind. Orn., ii. p. 553 (1790)?
Vieill., Ois. d'Am., Sept., ii. pl. 90 bis.

Numerous specimens, several of which are labelled "Cayenne." Undoubtedly the species described and figured by Vieillot and the Prince de Wied, but very doubtfully that of Latham. The description by Latham, from a specimen in the Leverian Museum, is short, but he says: "plumage above deep lead color, *nearly black*," which is difficult to apply to this bird, though his name is usually given for it, and regarded as synonymous with those above given. Latham says further: "native place uncertain," (Gen. Syn. Supp., p. 188).

This species has the bill and general structure more Sylvia-form than others of this group.

11. Dacnis brevipennis, (Giraud).
Helinaia brevipennis, Gir., Ann. Lyceum, N. Y., v. p. 40 (1850).
Ann. Lyc., N. Y., v. pl. 3, fig. 1.

Three specimens, one of which is labelled "Cayenne." The smallest species of this group, easily distinguished by the green color of the upper parts of the body, and light blue head. Though well described and figured by my friend Mr. Giraud, of New York, as above cited, this little bird seems to be unknown to naturalists. It belongs strictly to the same group of species as the two species immediately preceding, (*D. speciosa* and *D. bicolor*). I regard it as possible that this bird is the female or young of *D. speciosa*.

E. *Hemidacnis.*

Genus HEMIDACNIS, Sclater, Cat. Am. Birds, p. 50 (1861).

12. Dacnis albiventris, (Sclater).
Pipridea albiventris, Sclat., Rev. et Mag. Zool., 1852, p. 8.
Hemidacnis albiventris, Sclat., Cat. Am. Birds, p. 50.
Jard. Contr. Orn., 1852, pl. 100, fig. 2.

Two specimens, adult and young, obtained for the Academy Museum by its excellent members, Messrs. Geo. N. Lawrence and John G. Bell, of New York. Both from Bogota.

4. Genus CERTHIOLA, Sundeval, Vet. Acad. Handl., Stockholm, 1835, p. 99.

1. Certhiola flaveola, (Linnæus).
Certhia flaveola, Linn., Syst. Nat., i. p. 119 (1758).
Nectarinia antillensis, Less., Traite d'Orn., i. p. 304 (1831)?
Sloan, Jamaica, pl. 259. Edwards' Birds, pl. 122.

Numerous specimens from Jamaica and St. Thomas, West Indies.

2. Certhiola bahamensis, (Linnæus).
Certhia flaveola, *β*. bahamensis, Linn., Syst. Nat., i. p. 187 (1766).
Catesby, Carolina, pl. 59.

Quite distinct, and easily recognized by Catesby's figure and the characters pointed out by Prof. Reichenbach in Handb. Speciell. Orn., pt. v. p. 253, who very clearly defines this species.

3. Certhiola luteola, Cabanis.
Certhiola luteola, Cab., Mus. Hein., i. p. 96 (1850).
Reich., Völlst. Naturg. Vög., pl. 561, fig. 3822.

Numerous specimens from the Island of Trinidad, which seem to be this species. Others from Venezuela have the throat slightly darker, but are otherwise very similar.

4. Certhiola mexicana, Sclater.
Certhiola mexicana, Sclat., Proc. Zool. Soc., London, 1856, p. 286.

Resembling the preceding (*C. luteola*), but apparently distinct. Specimens in the Museum of the Smithsonian Institution and in the Academy Museum are from Mexico. One specimen from Ecuador much resembles these Mexican specimens.

5. Certhiola martinicana, Reichenbach.
Certhiola martinicana, Reich., Hanb. Spec. Orn., pt. v. p. 252 (1853).
Reich., Völlst. Naturg. Vög., fig. 3824.

Specimens from unknown localities, one of which only is labelled "*N. Am-*

tillensis, Lesson, Cayenne." One specimen, evidently not in mature plumage, has the superciliary stripes yellow, nearly uniform with the under parts of the body, but is otherwise not different. This species seems to be characterised by its white throat, which color is narrowly enclosed between the dark brown of the cheeks.

6. **Certhiola chloropyga**, Cabanis.
Certhiola chloropyga, Cab. Mus. Hein., i. p. 97 (1850).
Reich., Völlst. Naturg. Vög., pl. 561, fig. 3826. Hahn's Voegel, pt. xi. pl. 4?

Numerous specimens from Brazil. Apparently an abundant and rather widely diffused species. Total length about 4¼ inches.

7. **Certhiola guianensis**, Cabanis.
Certhiola guianensis, Cab., Mus. Hein., i. p. 97 (1850),
Reich., Voeg., fig. 3825.

Several specimens, one of which is labelled "Bresil." This species seems to be one of the smallest of the group, the specimens before me being even smaller than the measurements given by Dr. Reichenbach, (Spec. Orn., pt. v. p. 252). Total length 3½ inches.

The genus *Certhiola* is the most difficult of this group, and although the species have been indicated with singular ability by Dr. Cabanis, and subsequently more fully described by Dr. Reichenbach, they are not to be distinguished in most cases (as at present described,) without careful scrutiny. In addition to the preceding species, I have seen one other specimen, not in good condition, in the collection of the Smithsonian Institution, from Peru, which is apparently another and probably undescribed species.

5. Genus CONIROSTRUM, D'Orbigny et Lafresnaye, Mag. Zool., 1843.

1. **Conirostrum sitticolor**, Lafresnaye.
Conirostrum sitticolor, Lafres., Rev. Zool., 1840, p. 102.
Dacnis rufocinerea, Bonap., "1845," Consp. Av., i. p. 401 (1850).
Conirostrum rufum, Lafres., Mag. Zool., 1843, p. 3?
Conirostrum bicolor, Less.
Gray's Genera, i. pl. 34. Reich., Voeg., fig. 3751.

Six specimens, from "Bogota" and "Colombie." One specimen shows a tendency to *C. rufum*, which I have little doubt is the young of this species.

2. **Conirostrum rufum**, Lafresnaye.
Conirostrum rufum, Lafres., Mag. Zool., 1843, p. 3.

Four specimens from Bogota. This bird is very probably the young of the preceding.

3. **Conirostrum albifrons**, Lafresnaye.
Conirostrum albifrons, Lafres., Rev. Zool., 1842, p. 301.
Conirostrum atrocyaneum, Lafres., Rev. Zool., 1848, p. 9.
Conirostrum caeruleifrons, Lafres., Rev. Zool., 1842, p. 302.
Guerin's Mag. Zool., 1843, pl. 35. Reich., Voeg., fig. 3750.

Ten specimens, four of which are *C. albifrons;* four are clearly *C. caeruleifrons*, and two are intermediate, showing conclusively that the two are identical, as suggested by Dr. Sclater in Proc. Zool. Soc., London, 1855, p. 138; although in his Catalogue of American Birds (1862,) he continues to give them as distinct species.

4. **Conirostrum cinereum**, D'Orbigny et Lafresnaye.
Conirostrum cinereum, D'Orb. et Lafres., Mag. Zool., 1838, p. 25.
Conirostrum Fraseri, Sclat., Proc. Zool. Soc., London, 1858, p. 452?
D'Orb., Voy. Am. Mer. Ois., pl. 59, fig. 2.

Several specimens, one of which, labelled "Tacna, Peru," is from Mons. D'Orbigny's collection. Two others in a collection from Ecuador, recently presented by Dr. Thomas B. Wilson, seem to be *C. Fraseri*, Sclater, as above, and are only different in having the under parts of the body and the superciliary lines more strongly tinged with rufous, though my impression is that they are specifically identical with D'Orbigny's bird.

One specimen in the Museum of the Smithsonian Institution is the most mature and strongly characterized that I have seen, and is very nearly as represented in D'Orbigny's plate, above cited. It is quite possible that *C. Fraseri* is the young of a species allied to the present, but not identical.

6. Genus DIGLOSSA, Wagler, Isis, 1832, p. 280.

A. *Diglossa.*

1. **Diglossa baritula**, Wagler.
   Diglossa baritula, Wagl., Isis, 1832, p. 281.
   Uncirostrum Brelayi, Lafres., Rev. Zool., 1839, p. 281.
   Uncirostrum sittaceum, Lafres., Rev. Zool., 1839, p. 292.
  Gray's Gen. B., i. pl, 42. Reich., Voeg., fig. 3762, 3763.

Allied to and resembling the next two species, but easily distinguished from either, when in adult plumage, by the darker shade of color of the upper parts, and by the extension of the same color on the sides of the neck and throat, though there is usually a narrow space on the latter communicating with and of the same rufous as the under parts of the body. This species is about the same size as *D. similis*, with which it can readily be confounded. It is smaller than *D. sittoides*. Mr. Gray gives this little species with his usual great care and accuracy in the plate above mentioned.

Specimens are labelled "Mexico."

2. **Diglossa similis**, Lafresnaye.
   Diglossa similis, Lafres., Rev. Zool., 1846, p. 318.
   Diglossa hyperythra, Cab., Mus. Hein., i. p. 97 (1850).
  Reich., Voeg., fig. 3764.

Numerous specimens, generally labelled "Bogota" and "Columbie." This species is about the size of the preceding (*D. baritula*), and much resembles it, but is readily distinguishable by its throat being clear rufous, uniform with the other under parts. It resembles, even in a greater degree, the next species (*D. sittoides*), and in adult plumage is distinguishable only, so far as I can see, by its smaller size. The female of this species seems to present a peculiar character in having the under parts of the body with longitudinal stripes of dull olive, not very distinct, but to be traced in all specimens that have come under my notice. Dr. Reichenbach's figure, cited above, is a good representation of this little bird.

3. **Diglossa sittoides**, (D'Orbigny et Lafresnaye).
   Serrirostrum sittoides, D'Orb. et Lafres., Mag. Zool., 1838, p. 25.
   Uncirostrum Orbignii, Boiss., Rev. Zool., 1840, p. 5?
  D'Orb., Voy. Am. Ois., pl. 58, fig. 3. Reich., Voeg., fig. 3766.

Young birds, labelled "*U. Orbignii*," are in the Acad. Mus., but the adult is in the Museum of the Smithsonian Institution, and is precisely as given by Mons. D'Orbigny in the plate cited. This species is larger than either of the two preceding species, but is exceedingly similar in other respects to *D. similis*. The specimen now before me has the under parts rather paler rufous, but is, in fact, scarcely distinguishable from that species, (*D. similis*,) by any other character than its greater size, though I have no doubt that it is quite distinct, specifically. From Bolivia. I regard it as possible that this bird is the young or female of *D. brunneiventris*, Lafresnaye.

B. *Tephrodiglossa.*

4. **Diglossa carbonaria**, (D'Orbigny et Lafresnaye).
   Serrirostrum carbonarium, D'Orb. et Lafres., Mag. Zool., 1838, p. 25.

D'Orb., Voy. Am. Ois., pl. 58, fig. 1. Reich., Voeg., fig. 3760, 3761.

Specimens labelled "Bolivia," one of which is from M. D'Orbigny's collection. A curious and peculiar species, not intimately allied to, nor resembling any other. It is accurately figured in the plate of M. D'Orbigny, cited.

C. *Pyrrhodiglossa.*

DIGLOSSA MYSTACALIS, Lafresnaye.

Diglossa mystacalis, Lafres., Rev. Zool., 1846, p. 318.

Reich., Voeg., fig. 3756.

From Bolivia. One of the largest species, easily recognized by its black plumage, and rufous stripe from the base of the under mandible, on the side of the neck, and its rufous under tail coverts. Accurately described by the Baron Lafresnaye, and faithfully represented in the plate of Dr. Reichenbach's great work, as cited.

6. DIGLOSSA BRUNNEIVENTRIS, Lafresnaye.

Diglossa brunneiventris, Lafres., Rev. Zool., 1846, p. 318.

"Diglossa brunneiventris, Des Murs," Lafres., as above.

Des Murs, Icon. Orn., pl. 43.

One specimen from Bolivia, presented by the Smithsonian Institution, in the Museum of which I have seen others. This species is allied to the immediately preceding (*D. mystacalis*), but is smaller, and has the entire under parts fine rufous-cinnamon, which are black in that species. This bird may be the adult of *D. sittoides.*

D. *Cyanodiglossa.*

7. DIGLOSSA PERSONATA, (Fraser).

Agrilorhinus personatus, Fras., Proc., Zool. Soc., London, 1840, p. 23.

Uncirostrum cyaneum, Lafres., Rev. Zool., 1840, p. 102.

Diglossa melanops, Tschudi. Wiegm. Archiv, 1844, p. 294.

Reich., Voeg., fig. 3752, 3753.

Specimens labelled "Bogota" and "Columbie," generally very similar to each other, but one specimen, perhaps not adult, has little of the black front cheeks and throat which so strongly characterize this species, those parts being blue, nearly uniform with the entire other plumage. In fact, until undoubted specimens of the next immediately succeeding (*D. indigotica*) were received at the Acad. Mus., I had regarded it, doubtfully, as that species, though much too large. This specimen resembles Reichenbach's fig. 3752, cited above.

8. DIGLOSSA INDIGOTICA, Sclater.

Diglossa indigotica, Sclat., Ann. and Mag. Nat. Hist., xvii. p. 467 (1856).

"Diglossa indigotica, Verreaux MSS." Sclat., as above.

Sclater, Cat. Am. Birds, pl. 6.

Two specimens in a collection from Ecuador recently presented to the Academy by its generous and steadfast patron, Dr. Thomas B. Wilson. This species somewhat resembles the preceding, but is much smaller, and is otherwise quite distinct. It is very accurately represented in Dr. Sclater's beautiful plate, to which I refer, above.

E. *Melanodiglossa.*

9. DIGLOSSA LAFRESNAYEI, (Boissoneau).

Uncirostrum La Fresnayii, Boiss., Rev. Zool., 1840, p. 4.

Agrilorhinus Bonapartei, Fras., Proc. Zool. Soc., London, 1840, p. 22.

Reich., Voeg., fig. 3757.

Specimens labelled "Bogota" and "Pasto." The largest of the species enumerated in this paper, though but little exceeding *D. mystacalis.* This species and the next (*D. humeralis*,) are easily recognized by their uniform black plumage, only relieved by the light bluish shoulders.

10. DIGLOSSA HUMERALIS, (Fraser).
Agrilorhinus humeralis, Fras., Proc. Zool. Soc., London, 1840, p. 22.
Diglossa intermedia, Cab., Mus. Hein., i. p. 97 (1850)?
Reich., Voeg., fig. 3754.

Resembling the preceding, and, so far as I can see, only distinguishable by its smaller dimensions, as stated by Mr. Fraser, as above cited. Specimens from Venezuela.

11. DIGLOSSA ATERRIMA, Lafresnaye.
Diglossa aterrima, Lafres., Rev. Zool., 1846, p. 319.
Reich., Voeg., fig. 3759.

Specimens from New Grenada. Entirely black and easily recognized, though specimens apparently not mature have the under parts mixed with dull brown, which color prevails on the abdomen and under tail coverts.

12. DIGLOSSA ALBILATERALIS, Lafresnaye.
Diglossa albilatera, Lafres., Rev. Zool., 1843, p. 98.
Reich., Voeg., fig. 3758.

Numerous specimens, labelled "Bogota" and "Columbie." Uniform bluish black, with a tuft of white feathers on each side, under the wing. One plumage, however, which is perhaps not mature, is not black, but always distinguishable by the tuft of white feathers on the side. Upper parts (female or young) yellowish olive green, nearly uniform, under parts reddish ochre yellow, paler on the abdomen, wings and tail dark brown with all the feathers edged with olive nearly uniform with the back.

13. DIGLOSSA PLUMBEA, Cabanis.
Diglossa plumbea, Cab., Journ. Orn. 1860, p. 411.

Specimens from Costa Rica in the Museum of the Smithsonian Institution. This bird is strictly of the same group as that immediately preceding, and nearly of the same size, but quite a distinct and peculiar species.

7. Genus DIGLOSSOPIS, Sclater, Ann. and Mag. Nat. Hist. xvii. p. 467, (1856).

1. DIGLOSSOPIS CAERULESCENS, Sclater.
Diglossopis caerulescens, Sclat., Ann. and Mag. Nat. Hist. xvii. p. 467, (1856).
One specimen from Venezuela.

Dec. 6th.

Mr. LEA, in the Chair.

Fourteen members present.

The published number of the Proceedings for September and October was laid on the table by the Committee on Proceedings.

The death of Prof. B. Silliman, late a Correspondent of the Academy, on the 24th of November, was announced.

Dec. 13th.

Vice President BRIDGES in the Chair.

Eleven members present.

Dec. 20th.

Vice President **Bridges** in the Chair.

Seventeen members present.

The following papers were presented for publication and referred to committees.

"Catalogue of the Cold-blooded Vertebrata of Michigan." By E. D. Cope.

"Descriptions of six new Western Asiatic Unionidae." By Isaac Lea.

"Notes on some species of Birds from South America." By John Cassin.

Dec. 27th.

Mr. **Jeanes**, in the Chair.

Twenty-eight members present.

On report of the respective Committees, the following papers were ordered to be published.

Partial Catalogue of the Cold-blooded VERTEBRATA of Michigan.

Pt. I.

BY PROF. E. D. COPE.

The material whence the present synopsis is derived, is a collection sent to me by Prof. Manly Miles, of Lansing, composed of specimens belonging to the Flint Scientific Institute, to the State Agricultural College, and to the State Collection. As we have but few exact synopses of local collections made at the Northwest, it is hoped the following list may prove of value in indicating the general character of this part of the fauna.

DERMOPTERI.

Ichthyomyzon argenteus Gird. *Petromyzon* Kirtland.

GANOIDEI.

Lepidosteus huronensis. Numerous specimens. Saginaw Bay.

Lepidosteus oculatus Winchell. Pr. Ac. Nat. Sci., 1864. Duck Lake, Calhoun Co.

Amia calva L. Specimens with and without the caudal ocellus.

TELEOSTEI.

NEMATOGNATHI.

Ictalurus gracilis Gill. *Pimelodus gracilis* Hough.

A specimen with narrower head and larger eye than the caerulescens assigned to the above species with doubt, on account of the very imperfect descriptions given,

Ameiürus cupreus, Oakland Co.

Although Prof. Gill has assigned not more than nine branchiostegals to this genus, and I find ten in five specimens, and though Prof. Kirtland gives an anterior position to the adipose fin, which the latter do not exhibit, and though Rafinesque assignes fifteen anal rays and mine have 23 and 24, I prefer doubting the infallibility of these statements to giving another name to the Michigan fish; it is in any case no other described species.

Noturus flavus. No. 294, Swartz Creek, Genesee Co.

Six large specimens, not apparently differing specifically from smaller individuals from the Youghiogheny and Susquehanna Rivers. Some, however, have but nine branchiostegals instead of ten in the eastern specimens. The orifice of the duct of the poison gland[*] is irregular in position, being sometimes at the base of the posterior pectoral rays, and sometimes even on the side behind the fin, besides in its normal location below the scapular process. From it may frequently be drawn a solid gelatinous style ending in a tripod, each limb of which is dichotomously divided into short branches of regular length.

TELEOCEPHALI.

Eventognathi.

Semotilus corporalis, Putnam, not Abbott. Many specimens from near New Hudson, Oakland Co., from Swartz Creek, Genesee Co. and from Grosse Isle.

The Semotilus rhotheus has been regarded by my friend F. W. Putnam, as identical with this species (vid. Bulletin Mus. Comp. Zool., p. 8,) although I pointed out the differences in my first description (Proc. A. N. S., 1861, p. 564,) when I employed the name *cataractus* for corporalis. The latter occurs sparingly in the tributaries of the Delaware, but is very common in the affluents of the Susquehanna and Ohio. The former is rare west of the Delaware, where it is abundant, and reaches a large size. S. dissimilis[†] and pallidus are good species from west of the Mississippi.

Ceratichthys cyclotis,[‡] sp. nov.

Body much compressed, dorsally flat; the height 4 2–5ths in. total length. Muzzle obtuse, rounded; head entering 4⅓ times in length (to emargination

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[*] Vid. Günther Catal. Siluridæ, Brit. Mus. 1864.

[†] Of an allied genus, Pogonichthys, Dr. Hammond brought from near Bridger's Pass, an undescribed species. It may be called P. (Platygobio) gulonellus. It may be compared with the P. communis as follows:

communis.	gulonellus.
Ventrals acuminate, reaching anus.	Ventrals truncate, falling far short of anus.
Anal longer, with eleven rays.	Anal shorter, nine rays.
Breadth between eyes more than half the top of the cranium, and more than the height of operculum.	Breadth between eyes scarcely half length of cranium above, equal height of operculum.

Head 4½ times in length to caudal emargination; eye 5⅓ times in length of head. Scales $\frac{7}{5}$48. Fins D. 1·8; C. 19; V. 1·8; P. 16. From caudal to front base of anal, 2 in. 10 l. Total length, 6 in. 8 lines. Above ruddy ash, a faint longitudinal dark band on one row of scales above lateral line. Below yellowish white, lips and chin yellow; suborbital region ruddy.

[‡] To Ceratichthys must probably be referred the Leuciscus dissimilis Kirtld., a common fish in the tributaries of the Ohio. The general appearance differs considerably from that of the other species, especially in the more prominent muzzle, and, therefore, inferior mouth; but I find no ordinary characters indicating a different genus.

Ceratichthys micropogon is a species sent me by Jabob Stauffer, Secretary of the Linnæan Society, of Lancaster, and was taken in the Conestoga by a member of the Society, on one of its excursions. The appearance of the head of this fish is that of a Hypsilepis rather than of a chub, and the difficulty of discerning the minute barbels increases the liability to err in determining its affinities. Mouth slightly oblique, angle opposite anterior border of orbit. Latter enters 3¼ times in length of head, which is measured 3¾ times in length from muzzle to base of tail. The greatest depth is measured 4¼ times in the same distance. Head broad, muzzle obtuse, profile rounded descending. Caudal peduncle long. Scales, as in C. biguttatus, $\frac{6}{3}$40. Teeth 4—4, without proper masticatory surface. the posterior considerably hooked. Length, from origin of tail to anterior base of dorsal equal from dorsal to posterior nostril. Rays. D. 1·8; C. 9; A. 1—7; V. 8; P. 13. Above pale yellowish brown; a broad brown shade from end of muzzle to base of tail; below pale yellowish. Length, 3 in. 6 lin.

of caudal.) Anterior base of dorsal measures one-half the distance from end of muzzle to base of tail. Lateral line nearly straight. Operculum rounded posteriorly, scarcely concave above. Eye contained 5½ times in length of head. Scales $\frac{7}{5}41$; radii fewer and weaker than in biguttatus. Dermal head tubercles longest on vertex, smallest on muzzle, in four alternating rows, one on each side becoming superciliary. Fins, D. 1·9; P. 15; V. 1·8, just reaching vent; A. 1·8; C. 19. The dorsal and anal are much prolonged posteriorly, the greatest horizontal length of the former nearly equalling the length of the upper surface of the head. Six and eight inches are the longest dimensions before us. Color of upper surfaces olive brown; below, from above lateral line, yellowish; preopercular region rosy; pectorals slightly dusky, otherwise no fin markings.

This fish is shorter, stouter and blunter than the biguttatus, and has larger dorsal and anal fins, there being one more ray in the latter. The operculum is not so angulated or concave above.

In some of the specimens of this species, especially among the half-grown, I find a tooth of the second row of pharyngeals, found in Semotilus proper. Nevertheless the barbel is on the end of the maxillary, as in the type of Ceratichthys, and not above it, as in Semotilus. Specimens from Grosse Isle, from Waterford, Oakland Co., from Clinton River and from Bruce, Macomb Co., Michigan.

Ceratichthys stigmaticus, sp. nov.

Dorsal outline rising gradually from end of muzzle to base of dorsal fin. Muzzle projecting a little beyond premaxillary outline. Head (equal greatest depth) 4½ times in total length; eye 3⅓ times in length of head, its superior rim upon the frontal plane. Scales $\frac{7}{6}40$. Radii about 15 exposed, stronger than the concentric lines. Fins short, ventrals a little anterior to dorsal, not reaching the vent. D. 1·8; C. 20; A. 1·7; V. 8. From base of caudal to anterior base of dorsal, equal from latter to posterior nares. General color reddish, operculum and cheeks more silvery. A brown band from muzzle to eye, and a very distinct spot at base of tail. Total length, two and a half inches. Pharyngeal bones stout, the superior limb broad; teeth 1·4—4 : 1. Barbel on the end of the o. maxillare.

Rhinichthys lunatus, sp. nov.

Stout, the head broad, and contained four times in length to base of tail. Greatest height 4⅓ times in the same. Dorsal fin a little behind opposite ventrals; latter reaching anal. Caudal lunate, or with a broad shallow emargination. Eye a little less than one-fourth the length of the head. About twenty longitudinal rows between dorsal and ventral fins, and sixty traversed by the lateral line. From end of muzzle to base of first dorsal ray equal from latter point to concavity of caudal. Muzzle projecting just beyond mandible. Rays, D. 1·8; C. 19; A. 1—7; V. 1—8; P. 15. The largest specimens are 2½ inches long.

Above reddish brown, with irregular, rusty spots, which in small specimens trace a lateral shade, and extend on the abdomen; usually the latter is unspotted silvery.

Specimens from Grosse Isle, obtained by Prof. Fox. This fish is stouter than the atronasus, has a smaller eye and a less deeply forked tail, besides the difference in color. Marmoratus has a longer nose, (one more anal ray) and a caudal spot. From obtusus, meleagris and nasutus* it can also be readily distinguished.

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* Another species, brought by Dr. Hammond from Kansas, has not been described. Rhinichthys maxillosus is peculiar in its heavy muzzle, and broad mouth, and gular region, and for an elongate form and backward position of fins. Eye with considerable vertical range, entering 5¼ times into length of head, latter four times to base of tail. Greatest height five and a half times. From base of caudal to base of front ray of dorsal equal from latter point to opposite middle of orbit. Fins all small, especially the ventrals, which reach the vent. Dorsal originating a little

Hybopsis storerianus*. No. 329, Flint River at Flushing, Genesee Co.

Hybopsis hudsonius, Agass. No. 531. Lake.

Hypsilepis diplæmia. Specimens from near Lansing.

Hypsilepis frontalis†, Agass.

Numerous specimens from Grosse Isle, Detroit River, Three Mile Lake and Waterford, Oakland Co.; Swartz Creek, Genesee Co. and Monroe Co.

Specimens from the last locality, seven in number, represent a strongly-marked variety, characterized by the great elevation of the outline in front of the dorsal fin, and other points. From the first dorsal ray, the outline again descends, giving the fin a very oblique position: this extends also, when laid back, as far as above the fifth anal ray, while in frontalis it most usually reaches a point opposite the first ray only. The eye is contained four times in the length of the head—more frequently four and a half times in frontalis. The length of the head measures in the depth of the body, from the dorsal outline to the middle of the row below that bearing the lateral line; it extends nearly to the ventral outline in frontalis. The pharyngeal bones appear to be relatively rather stouter than in typical frontalis, and are not furnished with so prominent an inferior angle to the external ala. This, with the form of the body, would almost indicate a species; but as I find approximations in these and transitions in the other characters, I cannot so consider it. In H. frontalis the number of scales traversed by the lateral line varies from 38 to 43.

Hypsilepis cornutus Bd.

Specimens from Pine Lake, Emmet County, Bruce, Macomb County, and one from Swartz creek, agree with the many Susquehanna specimens in my possession in a more elongate form of head and body than specimens from tributaries of the Delaware. They often differ from those of the Susquehanna in having a row of scales or two more below the lateral line. In Delaware specimens the head is shorter than in the latter, not more so than in the former, but the depth of the body is greater than in either, entering in length to base of tail 3⅓ times—in the others 4 and 4⅓ times. The dorsal fin is a

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behind ventrals, like the anal slightly concave on the border. Caudal not deeply forked. Rays, D. I—8; C. 19; A. 1—7; V. 7; P. 13. Twenty-five rows of scales from dorsal to ventral. Largest specimen nearly 3 inches. Silvery. Pale cinnamon above; a dark lateral shade; yellowish below. A dark spot at base of caudal.

* Hybopsis phaënna is a species found in some of the tributaries of the Delaware, which I have received from Trenton, N. J., from my friend Charles C. Abbott. It is more elongate in form than H. hudsonius and storerianus, and has not the rounded front of the first or the small, compressed head of the last. Eye a little less than one-third length of head; latter 5⅓ times to concavity of tail, and more than equal greatest depth of body; in storerianus the head does not equal the depth, and the back is more compressed. Angle of mouth not posterior to anterior nostril. Scales $\frac{5}{4}$38. Lateral line very slightly deflected opposite dorsal fin. Base of caudal to posterior edge of dorsal equal from latter to beginning of skin of head. Rays D. 1·8; C. 19; A. 1·8, its outer border concave like that of dorsal; V. 1·9; P. 15. Length 4 inches.

Lateral band and below silvery, a dark shade passing through former; no spot at base of tail. Above pale ochre, with a faint median line.

The operculum of this fish is narrower than that of the hudsonius, rather than broader as in amarus, and the head is longer than in the latter. In storerianus the mouth is smaller, and the operculum broader, and with a prominent superior angle. The gracilis is said to have the pectorals reaching the ventrals, which I have not seen in any of the species at my disposal.

† Cyprinella, distinguished from Hypsilepis by its crenate teeth, must receive the Leuciscus kentuckiensis of Dr. Kirtland. It is abundant in the tributaries of the Ohio, where it represents the nearly allied C. analostana, Gird., of the Susquhanua and Delaware. The differences between these species are as follow:

analostana.	kentuckiensis.
Head 3⅔ to 4 times in length to base of tail.	Head 4⅓ times; muzzle more acute.
Scales $\frac{5—(6)}{2—(3)}$32—5.	Scales $\frac{6—7}{3—4}$ 38—40.

little more anteriorly situated in the Delaware specimens, and there is a row of scales more below the lateral line than in Susquehanna specimens. With typical specimens only, these might be regarded as representing two species, and as such I have already alluded to them ;* but in the large number of individuals at my disposal, I find transitions in all the points. The Delaware specimens more nearly resemble the H. cornutus, figured by Dr. Storer.

Squalius proriger.

Until more characteristic points are presented, I provisionally preserve unbroken a series of beardless Chilognath Cyprinoids, with pharyngeal teeth 2 or 1—4 or 5 : 5 or 4—1 or 2, of the type uncinato-subconici raptatorii, and not crenate ; the scales, with the usual extent of surface exposed ; the isthmus not wide, and the anal fin short. The long anal fin distinguishes Alburnus from it ; and the narrow exposed scale surface and masticatory teeth, Hypsilepis. *Clinostomus* Gir., may be said to be distinguishable by the prominent mandible and large gape, but Sq. lepidus (Heck. Fische Syriens, 89,) is quite similar in the former point, and the Clin. photogenis† has the cleft as short as in most Squalii. *Ptychochilus* Ag. seems not yet to have been sufficiently distinguished from Clinostomus, and resembles Squalius even more in its terminal mouth. If different genera are here united erroneously, it is because their characters have as yet not been pointed out. They embrace five Pacific slope species, six Eastern American, and many from the old world.

In the species now named the prolongation of the lower jaw is very great : it presents a symphysial knob beyond and above the premaxillary border. End of the maxillary opposite the middle of the pupil. Angle of opercular outline less than 90°. Head narrowed anteriorly ; eye four times in its length : latter four times in length to concavity of tail. Greatest height $5\frac{1}{4}$ times in the same. Ventrals a little in advance of dorsal : from front base of latter to base of tail equal from former point to half way between end of muzzle and nares. Teeth 2·5—4·1 in two specimens. Scales small, with especially strong concentric lines, $\frac{10}{5}62$. Dorsal high 1·8 ; Caudal deeply furcate, 19 ; Anal rather elongate, $1{\cdot}8\frac{1}{1}$. V. 8, not reaching vent ; P. 14, elongate. Total length three inches.

Rufus brown above half way to the lateral line ; a dark shade from end of muzzle to tail, covered with silvery, the latter extending to the belly. Sides punctulate anteriorly.

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* Proc. Acad. Nat. Sci., Phila. 1861, 522.

† Squalius photogenis. A species resembling some Alburni in its large caducous scales and attenuated form. Mouth quite oblique ; under jaw scarcely projecting : maxillary not reaching line of margin of orbit. Head entering $4\frac{3}{4}$ times into length to fork of caudal ; greatest depth seven times. Back broad. Fins D. narrow 8 ; C. 19, A. 1—10. V. little anterior to dorsal 9. P. narrow fulcate 13. Scales $\frac{5}{3}39$. Radii stronger than concentric lines. From base of caudal to base of first dorsal ray, equal from latter to anterior border of iris.

Above pale ochre, with a median brown line, and one on each side, from opercular upper angle to tail. Sides and below bright silvery, especially brilliant on the operculum and suborbital region. Lips blackish edged.

Length three inches.

Two specimens from the Youghiogheny River, Pa. This may be the species on which Rafinesque established his *Luxilus interruptus*, but the discrepancies are so numerous that the identification cannot be made

Besides the S. (*Clin.*) funduloides of Girard, another species occurs in the waters flowing into the Susquehanna. This, which may be called S. hyalope, was obtained in the Conestoga by J. Stauffer. Its form is that of a true Squalius—as S. cephalus, not having the prominent mandible and compressed body of the species included by Girard in Clinostomus. Mouth little oblique, extending to beyond opposite anterior border of orbit . Muzzle obtuse ; head elongate, broad, entering length to base of caudal $3\frac{3}{4}$ times. Diameter of eye contained $3\frac{1}{2}$ times in length of head, equal lower posterior border of operculum. Base of caudal to front base of dorsal equal from latter point to anterior border of pupil of eye. Teeth 1.4—5.1. Greatest depth $4\frac{1}{4}$ times in length to base of caudal. Scales $\frac{7}{4}45$, with ten or eleven strong radii visible. Fins small ; radii D. 8. C. 17. A. 1·8, V. 8. P. 11. Total length about three inches. Color whitish, becoming bluish dorsally ; no markings.

This fish is more compressed posteriorly, has a larger head and eye, and more projecting under jaw than the S. elongatus.

It resembles an Aspius no little, but differs in the shorter anal, and fewer pharyngeal teeth. The Alburnus acutus, badly described by Lapham, is evidently an allied species.

Two specimens; exact locality in Michigan not stated.

Since the above was penned, I have found that Bleeker (in Comptes Rendus xv. 1863,) has united the geuera which I have attached to Squalius to Aspius, placing Squalius with Telestes, Scardinius and Cyprinella as synonymes of Leuciscus. That Squalius and Telestes are identical, I fully believe; but if Cyprinella and Scardinius are not different from Leuciscus our ideas of characters must undergo a change.

Plargyrus americanus.

From Saginaw Bay, No. 253, and a variety from Grosse Isle, Detroit River, distinguished by its very elongate form, especially in regard to its caudal peduncle. Scales $\frac{9}{2}$46; that is, two rows less above the lateral line than in many high-bodied specimens; there are others quite intermediate.

Chrosomus eos Cope, Proc. Acad. Nat. Sci., Philadelphia, 1861, 523.

From New Hudson, Livingston County, from streams flowing into Lake Erie. Larger specimens of this species exhibit a short lateral line, though in many it is wanting. Its points of separation from erythrogaster are as follows:

erythrogaster.	eos.
Head less than one-fourth length to base of caudal. Head narrower; parietal width one-fourth distance from base of first dorsal ray to base of caudal, which is equal from first dorsal ray to nares.	Head more than one-fourth do. Head broader; parietal width one-third from first dorsal ray to caudal, which equals from dorsal to posterior margin of orbit.
Muzzle longer, overhanging, angle of mouth opposite nares.	Muzzle shorter, mouth more oblique, reaching edge of orbit.
Scales above lateral line 24 rows.	Scales above lateral line 18 rows.

Alburnops heterodon.

A species having the general structure of Alburnops, and pharyngeal teeth usually, but not always, presenting its characteristic masticatory surface. They have sometimes a trace of the creuulation pertaining to Cyprinella, and are arranged usually in but one row of four on each side, which is sometimes accompanied by a single tooth of the inner row. This species is, therefore, allied to Codoma, Cyprinella and Squalius. Scales $\frac{5}{3}$36, with about eleven distant radii on the rather broad exposed surface. Fissure of mouth not reaching line of orbit. Head one-fourth of length to base of tail, a little greater than greatest depth. Diameter of eye one-third of length of head. Operculum higher than long. Outline from end of muzzle to base of dorsal greatly ascending. Greatest breadth of head one-fourth of the distance from end of muzzle to base of dorsal. Dorsal high; the bony ray long; its front ray to the hinder as 2½ to 1, and contained 2½ times in the distance from its base to the origin of the caudal fin: like the ventrals, it is nearer the end of the muzzle than the base of the caudal. Ventrals reaching anus; pectorals falling much short of ventrals. Rays, D. 48; A. 8; V. 8.

Length two and a half inches.

Above yellowish-brown; the scales darker bordered; below yellowish-rosy, or sometimes golden. A dark lateral band from end of muzzle to tail, which is covered on the sides by a silver band with blue reflections.

Numerous specimens from Lansing; others from Grosse Isle.

Alburnops plumbeolus.

Form compressed; mouth oblique; mandible slightly more prominent than premaxillary border. Eye $2\frac{3}{4}$ in length of head; operculum higher than long; the superior border very short; the supero-posterior concave; posterior angle more than 90°. Length to base of tail a little over four times length of head, and $4\frac{2}{3}$ the greatest depth. Frontal and dorsal outline a gentle arch. Anterior base of dorsal half way between base of caudal and end of muzzle. Height of dorsal less than half length from its anterior base to base of caudal. Fins short; ventrals extending $\frac{2}{3}$ way to vent. Scales moderate $\frac{6}{3}39$, with seven or eight rather faint radii, and minute numerous concentric lines. Radial formula D. 1—8. A. 1—9. V. 8. P. 13.

Length three inches. Pharyngeal bones with strong ala, especially dilated on the superior angle, terminating in a sharp angle opposite the second tooth from above; lower limb long; teeth 2, 4—4, 2.

Everywhere silvery, with a blueish reflection, except a dusky vertex and brownish dorsal region and basal caudal spot.

From Flint, on a branch of the Saginaw.

I have regarded this species as an Alburnops on account of the distinct masticatory surface of the teeth, although the upper jaw does not overlap the lower as in the types of that genus. The form of the scales distinguishes it readily from Hypsilepis. It is generally similar to Squalius.

Alburnus[*] rubellus Agass.

The anal fin of this fish is shorter than in true Alburnus: teeth 2, 4—4, 2, without masticatory surface. Scales $\frac{6}{3}38$. Head $4\frac{1}{4}$ times in length to base of caudal.

Three specimens from Flint.

Pimephales milesii, sp. nov.

A species differing from the promelas in its larger scales, longer muzzle and other points approximating Hybognathus.

Mouth oblique, outlines of snout forming less than a right angle in profile. Eye entering $4\frac{1}{2}$ times in length of head, which latter is one-fourth of length to base of tail, and equal to greatest depth of body. Scales $\frac{7}{3}40$, nearly round, lateral line extending as far as the fourteenth. Dorsal fin with 1, 9 rays; the first and last jointed are equal, the middle the highest. Caudal wide; complete rays 21. Anal small, longer than wide, 1, 7. Ventrals not reaching anal, 1, 8. Pectorals extending three-fifths distance to ventrals. From base of caudal to front base of dorsal equal from latter point to anterior nostril. Frontal breadth double diameter of orbit. Length 2 in. 5 lines.

General color pale reddish-brown, much paler below, and a faint blackish longitudinal line. Top of head blackish; its sides silvery.

From Grosse Isle, Detroit River. Named from Prof. Miles, who, in connection with Prof. Fox, has added much to north-western Zoology.

Pimephales promelas, Raf.

Specimens from near Lansing.

Hyborhynchus[†] notatus, Agass.

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[*] Alburnus oligaspis.

Under jaw projecting a little beyond upper; maxillary extending to opposite posterior nostril. Head conic in profile, with muzzle compressed, one-fifth of length to notch of caudal. Eye three and one-fifth times in length of head. Operculum higher than long. Fins short (except anal); ventrals anterior to dorsal. Dorsal 1·8. C. 20. A. 1·14. V. 7. P. 15. Scales rather large, $\frac{5}{2}41$. Lateral line, with a long, gentle anterior deflection.

Length about two inches.

Above reddish; sides of head and broad lateral band silvery. Below medially yellowish.

Brought from Kansas, by Dr. W. A Hammond.

[†] In this place may be described the Algansea antica, sp. nov., brought by Dr. Woodhouse from Texas, and presented to the Academy Museum. It is nearest to the formosa of Girard,

One specimen from Grosse Isle, Detroit River.

Though differing in the development of the lateral line, this species stands near Pimephales in the character of the separation of the bony dorsal ray from the first cartilaginous by a membrane, (erroneously alluded to by some as a peculiar ray,) and in the arrangement of the tubercles on the front. Of the latter, there are two rows crossing the front of the muzzle; the inferior of six, of two on each side on the premaxillary border, and the outer near the eye; the superior of five, one on the middle line. A third row of four is on the border of the superior plane, one behind each pair of nares, and one on each side the middle line of the muzzle.

Hybognathus stramineus.

This genus embraces the described species argyritis, evansi, nuchalis, nitidus, regius and probably gardoneus (C. V.), to which are added here three others.

In the present species, the dorsal is situated nearer the end of the muzzle than to the base of the caudal, and its height is much less than half the distance from the base of its first ray to the same point; the head enters the length to the caudal a little over four times, being relatively longer than in the species described by Agassiz and Girard, while the eye, entering the length of the head but three times, is relatively larger. The depth enters the length 4¾ times. Scales $\frac{5}{4}$36; in evansi[*] $\frac{5}{4}$40. Ventral fins do not extend to the vent. The dorsal outline rises gently to the base of the dorsal; the profile descends abruptly at the end of the muzzle, which is prolonged in front of the orbit about three-fourths the longest diameter of the latter. Superior border of operculum usually shorter than the posterior. Pharyngeal teeth 4—4.

The general form is stout, and the head broad; caudal not deeply forked. Fin rays—D. 1. 8. C. 19. A. 7. V. 8. P. short, 13. Length about three inches. Color brownish straw color; sides and below silvery, the former most brightly. No dorsal line; a faint line on posterior part of lateral line, and a small spot at base of tail.

Many specimens from Grosse Isle, Detroit River.

Hybognathus volucellus.[†]

A species distinguished by its depressed elongate head and elongate fins, especially the dorsal. The latter is as far from the end of the muzzle as from

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but differs in the much more posterior position of the fins. In this, the anterior base of dorsal is equidistant between end of muzzle and base of tail: in the antica much behind the median point; the ventrals are much nearer the caudal than the chin; in the formosa, the reverse is the case. Scales $\frac{10}{5-6}$ 50. Head in adults a trifle more than one-fourth total length; eye one-fifth length of head. Maxillary not reaching line of margin of orbit; mouth oblique. Profile long, flat, descending; dorsal outline arched. Body of medium proportions, shortened behind; caudal Peduncle short, thick, Fins, D. 1—7 $\frac{1}{1}$; C. 19, short, emargination shallow; A. 1—8; V. 9; P. 16.

Sides of head and edges of scales punctulate; general tint above purplish-slate; below, with sub- and inter-operculum, yellow. Largest specimen five inches long. In some small specimens the eye is only one-fourth the length of the head. To the allied genus Lavinia belongs most probably the Leuciscus boscii of Cuv. et Val., from Carolina. The same genus occurs in Lake Ponchartrain.

[*] Brought by Hammond from the Upper Platte.

[†] Hybognathus procne has been sent me by my friend, Jacob Stauffer, as an inhabitant of the Conestoga, tributary of the Susquehanna. A small silvery fish, with compressed body and elongate caudal peduncle. Head enters total length 4¼ times; diameter of eye into head 2¾ or three times. Depth into length five or a little more times. From anterior base of dorsal to base of caudal longer than from former to end of muzzle; dorsal high, anterior rays equal ½ from their base to base of caudal. Scales $\frac{5}{2}$31. Tail entering total length 5¼ times, deeply forked; forks acute. Obliquity of mouth slight. Operculum higher than long; its infero-posterior border very oblique, long. Teeth R. 5—4 L. Length 2·5 inches.

Top of head, a narrow dorsal band, and the borders of the upper scales blackish; belly and sides of body and head silvery, along the middle line with blue reflections and black punctulations, the latter collected into a streak on the lateral line. Belly yellowish.

[illegible] longis subrectis [illegible]; margine [illegible]

[illegible] of Orphis, Asiatic Turkey. [illegible]

[illegible] antice [illegible] [illegible]

[illegible] subrecta [illegible]; margine [illegible]

[illegible] North [illegible] [illegible]

[illegible] Testa lævi, [illegible] [illegible] rotundata [illegible] [illegible]

[illegible]

[illegible] America.

[illegible]

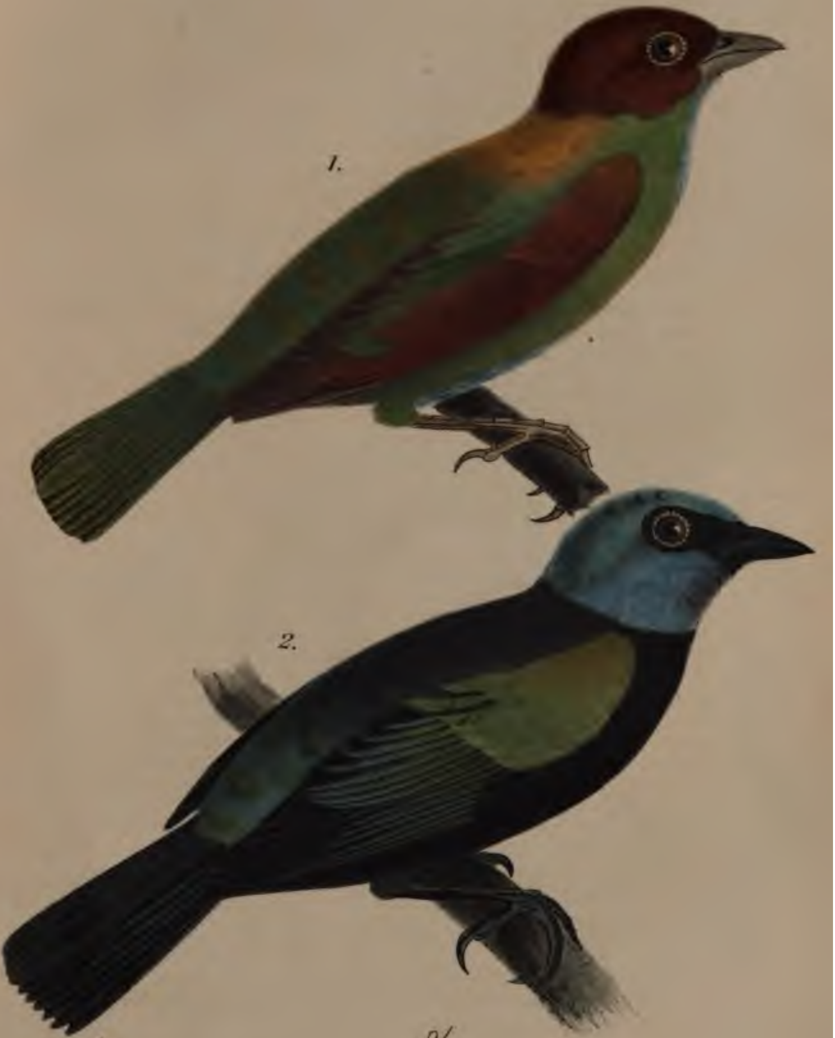
[illegible] greater [illegible] which [illegible] that [illegible] distinguishes it [illegible] is represented [illegible]

[illegible] species [illegible] known, which [illegible] may [illegible] distinguished, [illegible]

[illegible] 1844.)

[illegible] p. 172.

[Dec.



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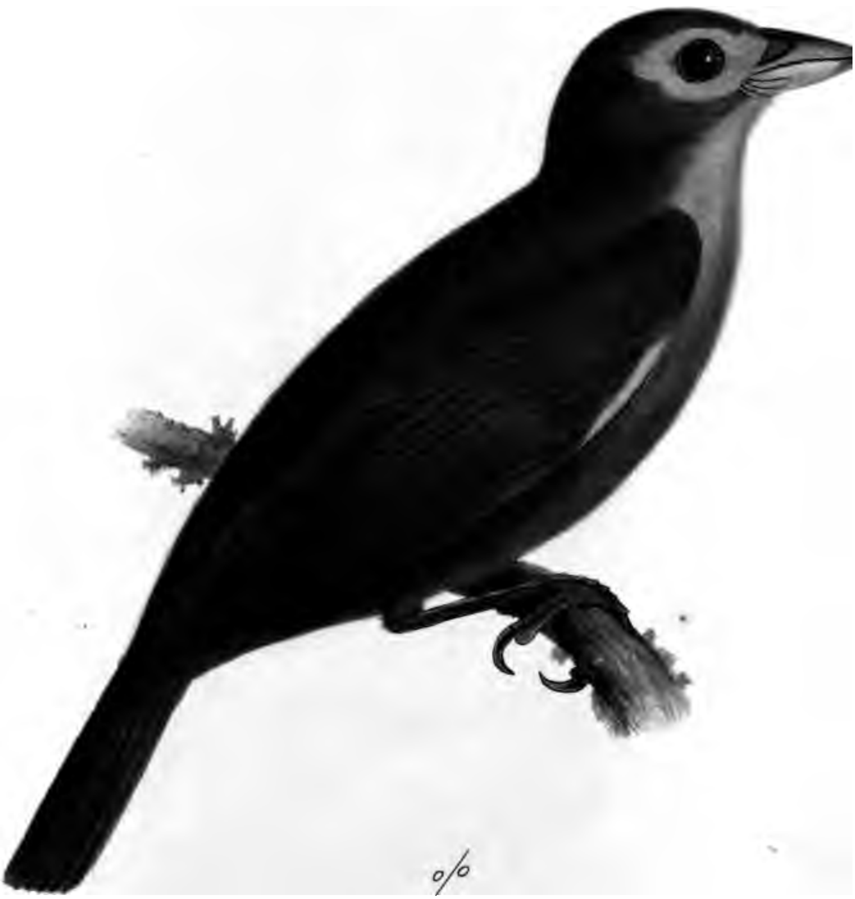
BOWEN & C° LITH & COL. PHIL.

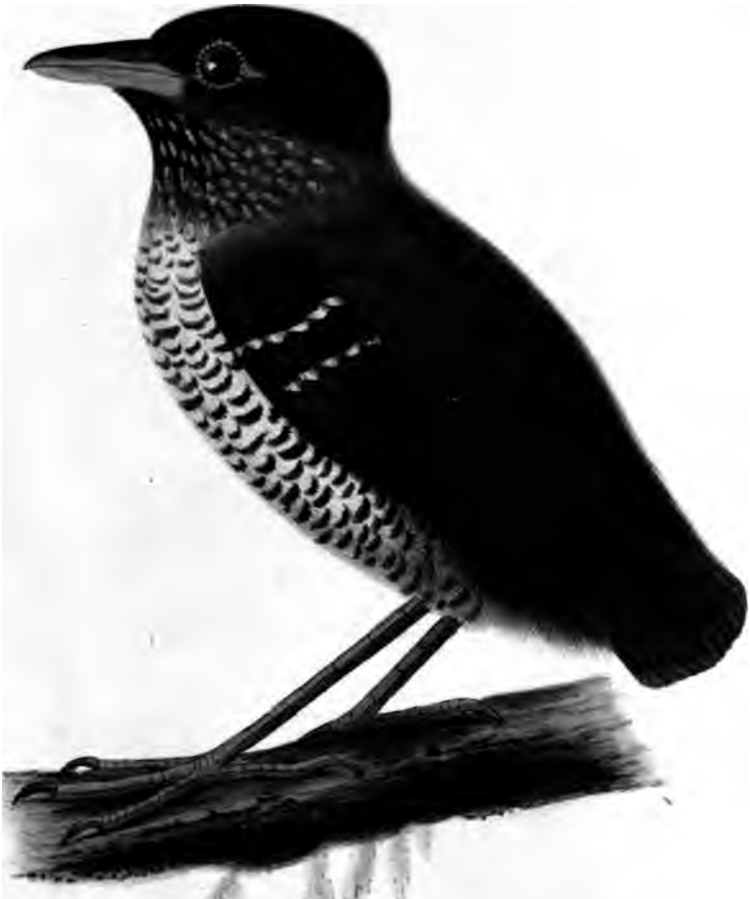
1. Calliste Laviniae. — 2. Calliste Hannahiae.

Proc. Acad. Philada. 1864. Plate 2.



BOWEN & Co LITH & COL. PHIL.

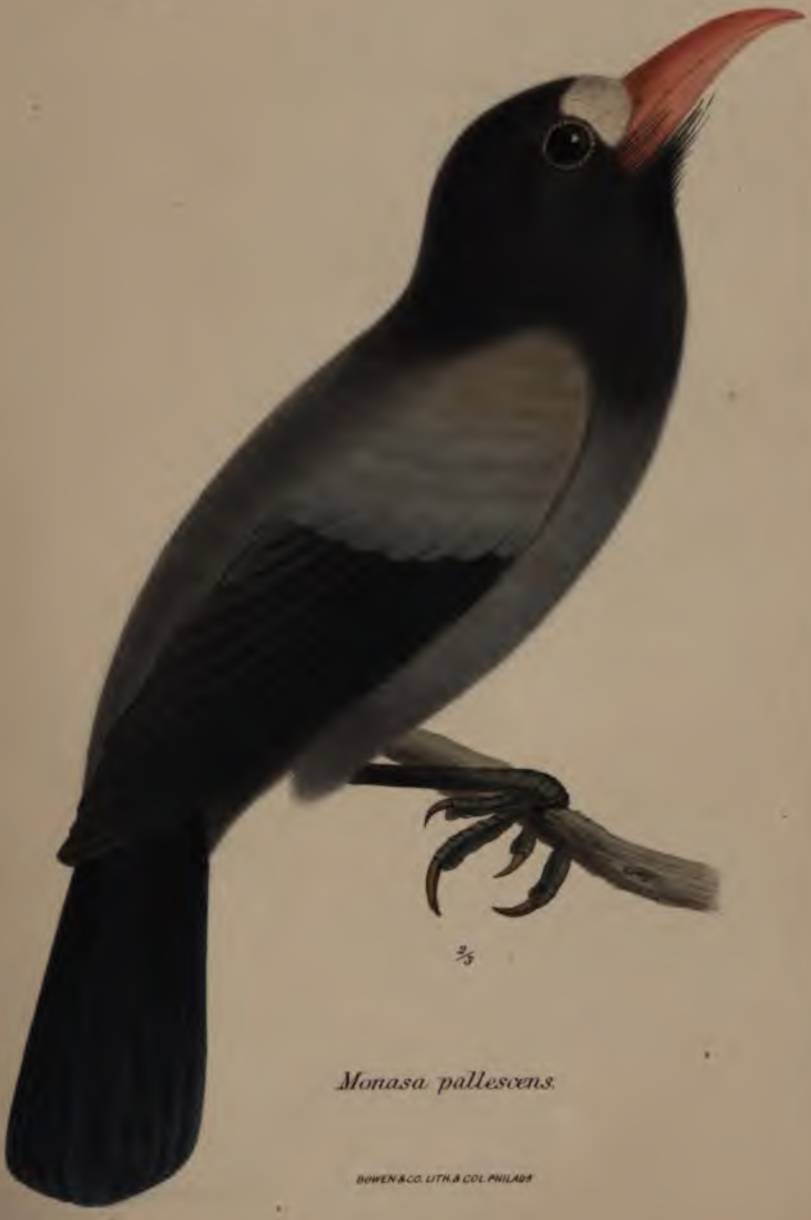
Orthogonys Olivaceus.



Pittasoma Michleri.

BOWEN & CO. LITH. & COL. PHILA

Insert tissue paper



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Monasa pallescens.

BOWEN & CO. LITH. & COL. PHILADA

All of these species are in the Academy Museum, and of the first three numerous specimens. Those three species are accurately and handsomely figured by Dr. Sclater in his Monograph of the genus Calliste.

2. **Calliste Hannahiæ**, nobis, (Plate 1, fig. 2.)

Resembling generally *C. cyaneicollis* (D'Orbigny,) but is rather larger, has the bill much smaller, and the abdomen always black (not blue as in that species.) The blue of the head above is also different in shade, being paler in the present bird, and this color has much greater *depth*, each feather being black at base, and with its terminal half pale verditer blue.

Entire head verditer blue, tinged with indigo blue on the throat; back and entire under parts lustrous black; shoulders golden green; greater coverts yellowish green; rump and upper tail coverts lustrous bluish and yellowish green. Quills black, edged externally with bluish green; tail black, all the feathers narrowly edged with green; under tail coverts black, with bluish green edges; under wing coverts black; bill and feet black. A narrow frontal band and stripe in front of the eye black.

Total length about 5 inches; wing 2¾; tail 2 inches.

Hab.—Merida Mountains, Venezuela.

Of this bird, I have now two specimens, one of which was brought from the locality above given, by Mr. George Robbins of this city, and which is undoubtedly correct. At first sight it much resembles *C. cyaneicollis*, but is not difficult to distinguish by the abdomen being quite black, uniform with the other under parts, and by the different blue color of the head, as above mentioned. The small bill in the present bird is also a strong character.

Numerous specimens of *C. cyaneicollis* are in the Philadelphia Academy, two of which are types from M. D'Orbigny's collection. All of them, and all others that I have seen, have the blue abdomen well marked as a character, and in one evidently quite mature specimen, marked "Chili," this character is so strongly developed and the blue color extends so far upwards towards the breast, that it seems to have induced some attention, and the specimen has been labelled in Europe "Esp. nouv. ?" In this specimen and others, the blue of the head is quite superficial. One other specimen, from M. D'Orbigny's collection, is in young plumage, but has the abdomen blue, though that color is only incipient on the top of the head. All have the bill larger than the present species. Our figure represents this bird of the size of life.

To one possessing attributes amongst the most noble of Christian civilization, an affectionate and most exemplary wife and mother, this bird is dedicated!

3. **Orthogonys olivaceus**, Cassin, (Plate 2.)

Orthogonys olivaceus, Cass., Proc. Acad. Philada. 1860, p. 140.

Of this curious bird no other specimens have come under my notice, than those described as above, which were obtained in the Cordilleras Mountains in New Grenada, by Mr. Charles J. Wood, of this city. It is given in our plate, of the natural size.

4. **Pittasoma Michleri**, Cassin, (Plate 3.)

Pittasoma Michleri, Cass., Proc. Acad. Philada. 1860, p. 189.

Since the publication of my description above cited, fine specimens of this bird have been received from Panama by Mr. George N. Lawrence, of New York, who notices them in his interesting and valuable papers on the birds of that isthmus, in the Annals of the Lyceum of Natural History of that city. The figure in our plate represents the adult male, and is about two-thirds of the size of life.

5. **Monasa pallescens**, Cassin, (Plate 4.)

Monasa pallescens, Cass., Proc. Acad. Philada. 1860, p. 134.

No other specimens of this bird have come under my notice since the publication of the description above cited. The figure in the plate accompanying this paper, is about two-thirds of the size of life, and represents the adult male from the mountain region on the Rio Truando, a tributary of the Rio Atrato, New Grenada.

6. **Monasa axillaris**, Lafresnaye.
Monasa axillaris, Lafres., Rev. et Mag. Zool. 1850, p. 216.
Monasa flavirostris, Strickland, Jard. Contr. Orn., 1850, p. 47.
Jard. Contr. 1850, pl. 48.

I mention this species only for the purpose of again stating, that its name is that of the Baron Lafresnaye as above given. The type specimen, now in the Academy Museum, was described by him while in possession of Messrs. Verreaux, of Paris, and the same specimen was described by Strickland, while afterwards it was in England *en route* to Philadelphia.

7. **Capito versicolor**, (Müller.)
Bucco versicolor, Müll., Syst. Nat. Supp. p. 88 (1776.)
Bucco pictus, Bodd., Tab. Pl. Enl. p. 20 (1783.)
Bucco elegans, Gm., Syst. Nat. i. p. 406 (1788.)
Bucco Maynanensis, Briss., Orn. iv. p. 102.
Buff. Pl. Enl. 330.

Of this species which seems to be little known to naturalists, one specimen, evidently in mature plumage, is in the Academy Museum, and was received some years since from the Hon. John Randolph Clay, in a collection made by him while Minister of the United States to Peru. The skin was one of several which had the appearance of having been made by a non-expert person, and is stated to have come from the mountainous region of the interior of that country. This species is figured by Buffon, as above cited, with sufficient accuracy for recognition.

The Annual Reports of the Recording Secretary, Librarian, and Curators were read, as follows:

REPORT OF THE RECORDING SECRETARY,

For 1864.

During the year ending 30th November, 1864, there have been elected thirteen members and nine correspondents.

The following members have died: Richard Randolph, Wm. D. Parrish, Samuel Ashmead, William J. Taylor, Thomas Dunlap, Wm. Pepper, M. D., John B. Myers.

The death of the following correspondents has been announced: Joseph Henderson, M. D., Francis Boote, Prof. D. J. Eschricht, Jaques A. Gay.

Two members have resigned.

The number of papers contributed and ordered to be published, during the same time, has been fifty-one, as follows:

Theodore Gill, twelve; Isaac Lea, LL.D., eleven; E. D. Cope, four; Elliott Coues, three; H. C. Wood, Jr., three; John Cassin, two; George W. Tryon, two; Jacob Ennis, two; A. Agassiz, S. F. Baird, Wm. M. Canby, T. A. Conrad, J. G. Cooper, M. D., Asa Gray, D. G. Elliott, C. A. Helmuth, Geo. N. Lawrence, Wm. Stimpson, Alex. Winchell, F. W. Lewis, M. D., each one.

All of which is respectfully submitted.

B. HOWARD RAND, M. D.,
Recording Secretary.

REPORT OF THE LIBRARIAN,

For 1864.

The Librarian begs leave, most respectfully, to report that during the past year the following additions have been made to the Library, viz:

Journals, 763; works on Anatomy and Physiology, 20; Antiquities, 3; Bibliography, 4; Botany, 39; Chemistry, 1; Conchology, 29; Entomology, 14; Geology, 69; General Natural History, 107; Helminthology, 4; Herpetology, 2; Ichthyology, 4; Languages, 4; Mathematics, 1; Mammalogy, 2; Medicine, 69; Ornithology, 24; Physical Science, 17; Politics, 1; Religion, 4; Useful Arts, 1; Voyages and Travels, 19. Total 1201.

Of these were volumes, 265; tracts and parts of periodica's, 936, divided as follows: Folios, 21; quartos, 256; octavos, 902; duodecimos, 22.

These have been received from the following sources, viz: Societies, 533; Editors, 149; Authors, 82; Smithsonian Institution, 10; University of Toronto, 1; Navy Department, 1; Treasury Department, 1; Library Fund, 137; Maclure Fund, 12; Minister of Public Works in France, 3; Dr. T. B. Wilson, 261; Mrs. Dr. Short, 2; Executors of Dr. Short, 4; J. C. G. Kennedy, 1; Charles H. Hart, 3; Select Council of Philadelphia, 1. Total 1201.

J. D. SERGEANT,
December 27, 1864. *Librarian.*

REPORT OF THE CURATORS.

For 1864.

The Curators report the Museum of the Academy to be in its usual good order and state of preservation. Some of the departments are still but partially arranged, and, under existing circumstances, the Curators see no way of completing the arrangement unless they are authorized by the Academy to employ aid for the purpose. Mr. Tryon has undertaken the arrangement of the conchological cabinet, and Mr. Durand has expended much labor in the arrangement of the recent rich additions to the herbarium.

Notwithstanding the extensive additions made in late years to the building of the Academy, the Curators feel the necessity of more space to accommodate the constantly increasing collections. Nearly all the departments are crowded, some of them to such an extent that it has become difficult to introduce a few additional specimens. It is to be hoped that the Academy will direct especial attention to the necessity of making future and ample provision to accommodate, display, and render convenient to access, the incessantly increasing museum and library.

During the year the Academy has been greatly enriched by a donation consisting of the magnificent Herbarium of the late Prof. Charles W. Short, of Louisville, Kentucky, presented by the family on the recommendation of Prof. Asa Gray, of Cambridge. A special notice of this collection will be found in the Report of the Botanical Committee appended to the present one.

Another rich addition, a legacy of our late fellow member, Samuel Ashmead, formerly one of the most efficient Curators of this Institution, consists of a first selection from a large and valuable private collection of about 2000 minerals, together with a beautiful collection of marine algæ, made with considerable labor and expense during the later years of Mr. Ashmead's life.

Our stores have further been increased, through the American Philosophical Society, by the deposit of the natural history collection of that time-honored Institution.

By resolution of the Academy, a small collection of ancient works of art have been deposited in the museum of the American Philosophical Society.

The following list exhibits the contributions to the museum of the Academy during the year in the various departments of natural history:

Mammals.—Of these five species, from Arctic America, were presented by Robert Kennicott, and one species by John Krider.

Birds.—Dr. T. B. Wilson and Joseph Jeanes presented 248 specimens, 144 species, from the West African collection of Duchaillu, and from Jalapa, Mexico, of the collection of D'Oca. The Smithsonian Institution presented 31 specimens, 25 species, from the collection of the U. S. Exploring Expedition of the Vincennes and Peacock, 100 specimens from Siam and 9 specimens from other localities. George N. Lawrence presented 51 specimens, 34 species, from Guatemala, New Grenada and Panama. Robert Kennicott presented 22 species from Arctic America. Of others, 36 specimens and 1 nest were presented by T. B. Wilson, J. Krider, C. J. and W. S. Wood, S. Ashmead, R. Frazer, J. Xantus, T. Wyld and D. Gilbert.

Reptiles and Fishes.—A small collection of reptiles from Corisco, W. A., was presented by Rev. R. H. Nassau, and 7 specimens were presented by F. R. Bingham, D. Gilbert and E. Draper. Of fishes 7 specimens were presented by T. Norris, C. A. Kingsbury and C. L. Pascal.

Mollusks.—The Smithsonian Institution presented 71 species of marine mollusca, and 294 species of shells, mostly American, mainly collected and labeled by W. Stimpson. George W. Tryon, Jr., presented 163 species of shells, mostly new to the museum of the Academy. Dr. Gundlach presented 20 species of Cuban shells. Of others, 16 species were presented by A. A. Gould, I. Lea, J. C. Fisher and J. H. Thomson. A small collection from the Florida Reef was presented by George Davidson. The American Philosophical Society deposited a small collection of shells.

Articulates.—The Smithsonian Institution presented 62 species of crustaceans, mostly from the collection of Dr. William Stimpson, of the North Pacific Exploring Expedition. Other crustaceans, insects and myriapods were presented by George Davidson, Rev. R. H. Nassau, F. R. Bingham, Dr. J. C. Fisher and H. L. Gaw.

Echinoderms, &c.—The Smithsonian Institution presented 16 species of echinoderms from the collection of W. Stimpson, of the North Pacific Exploring Expedition. Small collections of marine animals were presented by Rev. R. H. Nassau, Dr. J. C. Morris, S. Powell and George Merritt. A small collection of echinoderms, corals and sponges were deposited by the American Philosophical Society.

Fossils.—E. D. Cope presented 14 specimens of vertebrate liassic fossils from England. Small collections and specimens were presented by Gen. John F. Hartrauft, Lieut. A. W. Guernsey, Jacob M. Kunkel, Dr. J. Leidy, F. Peale, Col. W. D. Lewis, Jr., J. F. Frazer, R. E. Knight, J. C. Trautwine, Mr. Painter and Geo. W. Ward. The American Philosophical Society deposited a collection of green-sand fossils from New Jersey and Delaware, a collection of European tertiary fossils, small collections from various formations and localities, and a number of casts in plaster of the vertebrate fossils of the vicinity of Paris.

Minerals.—About 500 specimens of minerals were received as a legacy from the late Samuel Ashmead, of which about 400 have been labelled and intercalated with the mineralogical cabinet of the Academy. The mineralogical collection, deposited by the American Philosophical Society, contains many rare and valuable specimens, among which are rich native silvers, sulphurets of silver, tin, opal, &c., from Mexico. From this collection upwards of 450 specimens have been labelled and intercalated with the cabinet of the Academy. Altogether there have been added to the latter during the past year, about 1000 labelled specimens. Mr. Lea presented 27 specimens of minerals from Chester and Lancaster Co., Pa., and from New York. The Smithsonian Institution presented 27 specimens of rocks. Joseph Wharton presented 18 minerals from Lancaster Co., and 8 specimens were presented by J. D. Sergeant, W. S. Vaux and J. C. Trautwine. There were also obtained 12 valuable minerals in exchange.

Botany.—The magnificent herbarium of the late Professor Short, of Louisville, Ken., presented by his family, consists of almost 300 folio volumes, containing about 6000 species of American plants, and between 3000 and 4000 species of European plants, besides a number of unopened packages of tropical American plants. The collection of marine algæ of the late Samuel Ashmead, a legacy to the Academy, is contained in 12 thick quarto volumes. Besides these there are numerous microscopic specimens mounted in the usual manner on glass slides. A collection of marine and fresh water algæ, comprising about 700 species, a contribution by Leo Lesquereux to the Central Sanitary Fair, has been purchased by the Curators, according to a resolution of the Academy, of Dec. 6, 1864. Two large fungi were presented by A. Cunningham and Violetta W. Miller.

Miscellaneous.—An antique stone hammer from the copper mines of Lake Superior was presented by B. A. Hoopes; an Apache Indian skull from Texas by Dr. E. H. Abadie; 6 worked flints from Abbeville, France, by F. Peale; and a plaster cast of the Neanderthal skull by E. D. Cope.

Respectfully submitted by JOSEPH LEIDY,
Chairman of the Curators.

REPORT OF THE BOTANICAL COMMITTEE,

For 1864.

To the Curators of the Academy of Natural Sciences:

Gentlemen:—Since my last report, dated December 17th, 1857, our Botanical Department has been considerably enriched.

First, by a full set of specimens from the collections made on the Colorado Mountains by Dr. C. C. Parry, Messrs. Elihu Hall, Harbour and Howard.

Secondly, by the magnificent herbarium of the late Prof. Charles Wm. Short, of Louisville, presented to our Academy by his family, on the liberal recommendation of Prof. Asa Gray.

Thirdly, by the handsome collection of Marine Algæ, bequeathed to this institution by our late fellow-member, Mr. Samuel Ashmead.

Fourthly, by another most valuable collection of Algæ, once the property of Mr. Leo Lesquereux, of Columbus, Ohio, presented by him, as his contribution. to the Philadelphia Sanitary Commission, and just purchased by the Curators.

To the above I will add the Texas collections of Dr. Lincecum and Mr. Buckley; the herbarium of Dr. G. Watson, and several hundred plants from Wisconsin and Iowa received from Mr. T. J. Hale, in exchange.

The greatest part of the Colorado specimens were either new to our North American herbarium, or duplicates (handsomer and more complete) of those collected by Mr. Nuttall, in his rapid travels over the Rocky Mountains.

The Short-Herbarium is, indeed, the greatest acquisition ever made by our Botanical Department, and will constitute two distinct large herbaria: one of tropical, the other of extra tropical plants. The latter, already arranged by Prof. Short himself, on the same Linnæo-natural plan as our general herbarium, contains, as far as I can judge, about 4000 European and between 6 and 7000 North American species. Among the latter are many new plants to our Botanical Department, derived principally from the last collections of Mr. Charles Wright in New Mexico, Sonora and Cohahuila; from the Texano-Mexican herbarium of Berlandier; from the Collection of Ervendberg in the province of Huasteca, and other Mexican plants from the collection of Drs. Gregg and Coulter, besides a small number from the North American British provinces.

This herbarium is, perhaps, not excelled in the scientific world for the magnificence, freshness and completeness of its specimens, and the costly style with which it has been fitted up. It is contained in upwards of three hundred wooden cases, elegantly shaped in the form of folio volumes, each volume averaging from thirty to fifty specimens, enclosed separately in sheets of fine white paper; the large *genera* or several of the kindred genera under a colored cover, and the American kept apart from the European, each in its portfolio.

The tropical plants are yet in numerous unopened packages, consisting of Holton's *Flora Neo-Granadina*, 1852–53; Fendler's *Plantæ Venezuelanæ*, 1854–57; Couthony and Jameson's *Plants of the Andes of Quito;* R. C. Alexander's *Plantæ Jamaicenses;* Ch. Wright's *Plantæ Cubenses*, &c., &c. When these collections are properly arranged, they will constitute an almost complete equatorial herbarium of about 6000 species.

Besides the above collections, I have to mention a package of East India Ferns, collected by Dr. Griffith; another of Australian Algæ, with other minor packages of Cryptogamous plants, and the two fine volumes of American *Musci et Hepaticæ* by Mr. Wm. S. Sullivan, all derived from the splendid Short-Herbarium.

Mr. Ashmead's collection of Algæ is, I believe, principally composed of American species. It is neatly set up in twelve elegant cases, in the form of quarto volumes.

The Lesquereux's collection is particularly valuable, containing over 700 species authenticated by the best Algologists of the age, Messrs. Lenormand, Desmazières, Agardh, Mongeot, Meklenbeck, Bonjean and others, among which Mr. Lesquereux's name is not to be passed in silence.

Respectfully, E. DURAND,
Chairman of the Botanical Committee.

The election of officers for the ensuing year was held, in accordance with the By-Laws, with the following result:

President	ROBERT BRIDGES, M. D.
Vice-Presidents	Wm. S. Vaux. John Cassin.
Corresponding Secretary	Thomas Stewardson, M. D.
Recording Secretary	B. Howard Rand, M. D.
Librarian	J. D. Sergeant.
Treasurer	Wm. C. Henszey.
Curators	Joseph Leidy, M. D. Wm. S. Vaux, John Cassin, J. D. Sergeant.
Auditors	Wm. S. Vaux, Joseph Jeanes, Aubrey H. Smith.
Publication Committee	Wm. S. Vaux, Isaac Lea, Robert Bridges, M. D. Joseph Leidy, M. D. Thomas Stewardson, M. D.

ELECTIONS FOR 1864.

The following persons were elected Members,—viz:

Jan. 26.—Robt. Briggs, Augustus Fiot.

Feb. 23.—Prof. Richard S. Smith.

March 29.—John M. Maisch, J. R. Goodman, M. D.

April 26.—A. Paul Turner, M. D.

June 28.—Horatio C. Wood, Jr., M. D.

July 28.—Jos. Wharton.

Nov. 29.—Dr. Frederich A. Keffer, U. S. A., Geo. F. Knorr, M. D. Chas. T. Bonsall.

Dec. 27.—J. T. Rothrock, Redwood F. Warner.

The following were elected Correspondents:

Jan. 26.— Am. Boivin of Paris, Thos. Rupert Jones.

Feb. 23.—Alex. Agassiz, Cambridge, Mass.

April 26.—Dr. A. C. Hamlin, U. S. A.

June 28.—Prof. Manly Miles, of Lansing, Mich.; Maximilian, Prince of Wied.

Sept. 27.—P. J. Van Beneden, Bruxelles.

CORRESPONDENCE OF THE ACADEMY,

For 1864,

Letters were received and read as follows:

January 5th.—Thomas B. Wilson, M. D., Newark, Del., Jan. 1st, 1864, acknowledging his election as President of the Academy.

American Antiquarian Society, Worcester, Mass., 22d Dec., 1863, acknowledging the receipt of the publications of the Academy.

Chicago Historical Society, 27th Dec., 1863, of the same tenor.

February 9th.—Mr. Aug. Fiot, Bethlehem, Pa., 6th Feb., 1864, acknowledging his election to membership.

March 8th.—Smithsonian Institution, Washington, Jan. 21st and 2d March, 1864, accompanying donations.

March 15th.—The Royal Academy of Sciences, Lisbon, July 11th, 1863;
Society of Natural Sciences, Hamburg, Feb. 15th, 1863;
Imperial Academy of Sciences, etc., Lyons, 11th April, 1863;
Imperial Academy of Sciences, etc., Vienna, Aug. 25th, 1863; severally accompanying donations to the Library.

The Royal Horticultural Society, London, Oct. 17th, 1863;
Geological Society, London, Nov. 4, 1863;
Natural History Society, Danzig, 8th Aug., 1863;
Natural History Society, Nürnberg, Sept. 30th, 1863;
Essex Institute, Salem, Mass., March 1st, 1864;
New York State Library, Feb. 1st, 1864;
Academy of Sciences, St. Louis, Jan. 30, 1864; severally acknowledging the receipt of the publications of the Academy.

Royal Society of Sciences, Leipzig, 22d Aug. and 11th Oct., 1863;
Society of Natural Sciences, Luneberg, June 23 and Aug. 24, 1863;
Royal Society of Zoology, Amsterdam, Aug. 25, 1863;
Society of Friends of Natural History, Mecklenburg, Aug. 29, 1863;
Natural History Society, Emden, Oct. 8th, 1863; transmitting their publications and acknowledging the receipt of those of the Academy.

March 22d.—Historical Society, Chicago, March 18, 1864;
The Literary and Historical Society, Quebec, March 17, 1864, each accompanying donations.

M. Mechelin, Paris, Feb. 20th, 1864, proposing the sale of a collection of Zoophytes.

U. S. Sanitary Commission, March 15th and 22d, 1864, accepting the offer of the use of the Hall of the Academy and returning thanks for the same.

The American Philosophical Society, March 19th, 1864, submitting resolutions of the Society in reference to the deposit of specimens.

May 3d.—Imperial Society of Naturalists, Moscou, Sept., 1863;
Upper Hessian Society for Natural History, Giessen, Aug. 27th, 1863;
Royal Swedish Academy of Sciences, Stockholm, Nov. 18th, 1863;
Senckenberg Natural History Society, Frankfurt-am-Main, Nov. 5, 1863;
Royal Prussian Academy of Sciences, Berlin, Nov. 30, 1863;
Imperial Society of Agriculture, &c., Lyons, April 12, 1863; severally transmitting their publications.

German Geological Society, Berlin, Nov. 5th, 1863;
Natural History Society, Halle, Oct. 30th, 1863;
New York State Library, March 17, 1864;
Smithsonian Institution, Washington, Feb. 26, April 3, June 25, July 13, Oct. 29, Nov. 28, 1863;
Liverpool Literary and Philosophical Society, Feb. 29, 1863;
Natural History Society, Bern, (no date);
Swiss Society of the Collective Natural Sciences, Bern, (no date);
Batavian Society of Natural Sciences, Rotterdam, Oct. 19, 1863;
Lyceum of Natural History, New York, 23d Jan., 1864;
Society "Isis," Dantzig, Nov., 1863; severally acknowledging the receipt of the publications of the Academy.

The Society of Natural Sciences of the Duchy of Luneberg, June 28, 1863;
Natural History Society, Freiburg, 19th Oct., 1863;
Zoological Society, Frankfurt-am-Main, Jan., 1864;
Royal Society of Sciences, Upsal, 15th Oct., 1863;
Natural History Society, Augsburg, 28th Aug., 1863;
Natural History Society, Dantzig, Oct. 22d, 1863; transmitting their publications and acknowledging the receipt of those of the Academy.

Society of Physicians, Steinmark in Graz, Dec. 11th, 1863;
Imperial Public Library, St. Petersburg, Jan. 10th, 1864; requesting exchanges.

July 5th.—T. Rupert Jones, Sandhurst, Eng., June 1st, 1863, acknowledging his election as correspondent.

Alexander Agassiz, Cambridge, 5th May, 1864, of the same tenor.

The British Museum, April 27th, 1864;
Geological Society, London, April 27, 1864;
New York State Library, June 11th, 1864;
Senckenberg Natural History Society, Jan. 30, 1864;
Wurtemburg Soc. of Natural History, Oct., 1863;
Royal Leopoldine-Carolinian Academy, Dresden, Sept. 7th, 1863;
Lyceum of Natural History, New York, June 15, 1864;
Imperial Society of Naturalists, Moscow, 16th and 30th Dec., 1863;
University Göttingen, June 16, 1864;
Imperial Geological Institute, Vienna, Aug. 27, 1863;
W. Haidinger, Vienna, Aug. 27, 1863;
The Natural History Society, Augsburg, Dec., 1863; severally acknowledging the receipt of the publications of the Academy.

The Royal Society of Sciences, Göttingen, Feb., 1864;
Royal Leopoldine-Carolinian Academy, Dresden, Feb. 24, 1864;
Royal Bavarian Academy of Sciences, April 8th, 1864;
Smithsonian Institution, Washington, June 16th, 1864;
Catholic University of Louvain, Dec., 1863;
Senckenberg Natural History Society, Jan. 30, 1864;
Royal Society of Sciences, Liege, Jan. 24th, 1864;
Society of Naturalists, Halle, Feb. 16, 1864; severally transmitting donations.

The Geological Survey of India, 1st Oct., 1863, transmitting its publications and acknowledging the receipt of those of the Academy.

August 23d.—The Entomological Society, Philada., July 19th, 1864, transmitting a donation from Prof. Gundlach.

The Asiatic Society, Calcutta, April 25th, 1864, requesting a supply of deficiencies of the Proceedings.

October 4th.—C. L. Pascal, Philada., Oct. 4, 1864, accompanying a donation of specimens of Salmo fontinalis, with some remarks thereon.

Wm. Couper, Quebec, 26th Sept., 1864, offering to exchange Vols. I.—V.

and part of Vol. VI. of the First Series of the Journal for a copy of Say's Entomology.

November 1*st.*—Natural History Society of Prussian Rhineland and Westphalia, 11th March, 1864;

Linnean Society, Emden, Aug. 5th, 1864; acknowledging the receipt of the publications of the Academy.

The Society of Natural Sciences, Zurich, 31st March, 1864, of the same tenor, and desiring missing numbers.

Royal Prussian Academy of Sciences, Feb. 29, 1864;

Royal Academy of Sciences of Madrid, May 3, 1864;

Senckenberg Natural History Soc., June 7, 1864;

Natural History Society, Luneberg, May 2, 1864; severally transmitting their publications.

Royal Academy of Sciences, Vienna, June 23d, 1864;

Society of Physics and Natural History, Geneva, June 21, 1864; transmitting their publications and acknowledging the receipt of those of the Academy.

The Natural History Society of Hanover, April 8, 1864, transmitting its publications and requesting exchange.

December 13*th.*—C. T. Bonsall, Philada., Dec. 12, 1864, and from Geo. F. Knorr, Philada., Dec. 13, 1864, severally acknowledging their election as members.

The Royal Academy of Sciences of Madrid, April 20, 1864;

Royal Society, London, May 16, 1864;

Historical Society, Chicago, Dec. 9, 1864; severally acknowledging the receipt of the publications of the Academy.

December 27*th.*—The Batavian Society of Sciences, Rotterdam, Aug. 20, 1864;

Natural History Society, Augsburg, Sept. 6th, 1864;

Imperial Society of Sciences, Moscow, Dec. 27, 1864;

Imperial Academy of Sciences, Vienna, Oct. 8th and 10th, 1863;

Royal Academy of Sciences, Amsterdam, Oct. 28th, 1863;

Lyceum of Natural History, New York, April 18, 1864;

Senckenberg Natural Hist. Society, Frankfurt-am-Main, Oct., 1864;

Society of Natural History, Luneberg, Oct. 16, 1864;

Smithsonian Institution, Washington, Jan. 27, 1864;

Royal Lombardian Institute of Science, &c., Milan, Dec. 2, 1863;

Academy of Sciences of the Institute of Bologna, April 15, 1864;

Natural History Society in Basel, Sept. 27, 1864; severally acknowledging the receipt of the publications of the Academy.

The Royal Danish Academy of Sciences, Copenhagen, June 9, 1864;

Royal Academy of Sciences, Amsterdam, April 4, 1864;

Royal Society of Sciences, Upsal, Sept. 1, 1864;

Society of Friends of Natural History, Mecklenberg, Sept. 18, 1864;

Geological Survey of India, Calcutta, March 22, 1864;

Academy of Sciences of the Institute of Bologna, April 18, 1864;

Royal Meteorological Institute of the Low Countries, Utrecht, July 29, 1864; severally transmitting their publications.

The Royal Danish Academy, Copenhagen, June 9, 1864;

Natural History Society in Halle, Sept. 27 and 28, 1864;

Natural History Society in Emden, Oct. 1, 1864; severally transmitting their publications and acknowledging the receipt of those of the Academy.

DONATIONS TO THE MUSEUM.

1864.

Abadie, Dr. E. H. *Nov.* 22. Skull of a Mescalero Apache Indian. From the Desert of the Black Hills, Texas.

Algæ. A collection of Marine and Fluviatile Algæ, consisting of about 700 species. Purchased.

American Philosophical Society. A large collection of Minerals, Fossils, Shells, &c., formerly comprising the natural history cabinet of the American Philosophical Society. Deposited.

Ashmead, S. *Apr. 19th.* Recurvirostra americana, Beesley's Point, N. J. A large collection of Minerals, being a selection from the cabinet of our late fellow member Samuel Ashmead, and the entire collection of North American Marine Algæ, contained in twelve quarto volumes, formerly belonging to the same. A bequest.

Bingham, F. R. *Jan. 19th.* Three species of Serpents, a Centipede, two insect Larvæ and a large Tadpole. From Demarara.

Cope, Edward D. *May 17th.* Six specimens of a large Ganoid Fish. Two Skulls, two Muzzles, an entire Animal and a sclerotal ring of Ichthyosaurus (two species.) Paddle of Ichthyosaurus, with the impression of the Skin. From the Lias of Barrow, Leicestershire, England. Cast of Prof. Fuhlrott's Neanderthal Skull.

Cunningham, A. *Nov. 22d.* Large Fungus, Mt. Ephraim, N. J.

Davidson, George. *March 8th.* A small collection of Mollusks and Crustaceans, from Florida Reef.

Draper, E. *Oct. 4th.* Young Coluber eximius.

Fisher, Dr. J. C. *Nov. 15th.* Cray Fish, from the Mississippi at New Orleans. Large Oyster Shell, from Barataria Bay.

Frazer, J. F. *Dec. 20th.* Two Fossil Whale Vertebræ, from a bluff of York River about five miles above Yorktown.

Frazer, Robert. *April 19th.* Anas boschas, var., Atlantic City, N. J.

Gilbert, Dr. D. *Feb. 2d.* Two embryo Turtles and Nest of the Hanging Bird.

Gould, A. A. *Jan. 5th.* Six species of Strepomatidæ.

Guernsey, Lieut. A. W. *Sept. 20th.* Three Fossil Shells and the caudal vertebra of a Whale, from the miocene formation, near City Point, Va.

Gundlach, Dr. *July 19th.* Twenty species of Terrestrial Mollusks, from Cuba.

Hartrauft, Gen. J. F. *Nov. 15th.* Fossil Whale Vertebra, from the miocene, near Petersburg, Va.

Hoopes, B. A. *Nov. 15th.* Stone Hammer, from the ancient copper mine pits of Lake Superior.

Jeanes, Joseph. Twenty-seven specimens, of thirteen species of Birds, from Du Chaillu's collections in Western Africa. Forty-seven specimens, 18 species of Birds, from Mr. D'Oca's collections at Jalapa, Mexico.

Kennicott, Robert. *Feb. 9th.* Five specimens, of four species of Mammals, from Arctic America. *March 8th.* Twenty-two specimens, of twenty-one species of Birds, from Arctic America.

Kingsbury, Dr. Charles A. *Oct. 4th.* Salmo fontinalis, Hartford, Conn., and Salmo amethystus, from Maidstone Lake, Essex Co., Vt.

Knight, R. E. Specimen of Sigillaria, from Carroll Co., Ohio.

Krider, John. *Apr. 19th.* Gerbillus canadensis, Bristol, Bucks Co., Pa. Three species of Birds.

Kunkel, J. M. *June 22d.* A collection of Fossil Plants and Shells, from the triassic rocks, near Frederick, Md.

Lawrence, George N. *March 8th.* Fifty specimens, of forty species of Birds, from Guatemala and New Grenada. *Apr. 19th.* One species of Glossophaga, from Panama.

Lea, I. *Jan. 5th.* One species of Strepomatidæ. *Feb. 2d.* Seven species of Strepomatidæ. *Feb. 9th.* Actinolite and Clinochlore, near Leni, Del. Co., Pa. *March 8th.* Williamsite, Texas, Lancaster Co., Pa.; Talc, Deweylite and Clinochlore, Westchester; Leelite and Clinochlore, Unionville, Chester Co.; and Chlorite, Leni, Del. Co. *March 15th.* Two species of Physa. *Apr. 12th.* Five varieties of Emerylite and one of Corundum, Chester Co. *Apr. 19th.* Crystallized Brucite, Texas, Lancaster Co.; Glassy Felspar, Del. Co. *May 10th.* Six specimens of Minerals, from Chester Co.; two from Texas, Lancaster Co., Pa. *May 17th.* Mica, Apatite, Feldspar and Pyroxene, Geiseckite, Pargarite, Calcite, Brown Tourmaline and Dodecahedral Quartz, from New York. *June 22d.* Two species of Strepomatidæ. *Dec. 13th.* Talc, Westchester; two specimens Octohedral Iron, Knauertown, Pa.

Leidy, Joseph. *Sept. 20th.* Twenty-two Fossil Echini, from Mecklenberg, Germany.

Lewis, Col. W. D. *Sept. 20th.* A Fossil Fish, from Solenhofen.

Low, H. L. *July 12th.* Corydalus cornutus.

Merritt, George. See Morris.

Miller, Violletta W. *Nov. 22d.* Large Polyporus, Westville, N. J.

Morris, Dr. J. C. *Nov. 15th.* A small collection of Marine Animals, from Newport, R. I. Presented by Dr. J. C. Morris, S. Powel and George Merritt.

Nassau, Rev. R. H. *June 14th.* A collection of Reptiles, Julidæ and Marine Animals, from Corisco, West Africa.

Norris, Thad. *Oct. 4th.* Head of a huge Pike, from Connaught Lake, near Meadville, Pa. A four pound Trout, Salmo fontinalis, from near Lake Superior.

Painter, Mr. *Jan. 5th.* A Fossil Coral.

Pascal, C. L. *Oct. 4th.* Three Trout, Salmo fontinalis, one weighing five and three-quarter pounds, from Sault St. Marie.

Peale, F. *Apr. 5th.* Six Fossil Bones and Worked Flints, from Abbeville, France. Received by Mr. Peale from M. De Perthes.

Powel, S. *Sept. 20th.* A Scutella, from Newport, R. I.

Sergeant, J. D. Six specimens Ores of Manganese, Gloucester Co., N. B.

Shepard, C. U. *Apr. 12th.* Eleven fragments of Meteorites and a large Rutile, from Georgia. Received in exchange.

Short, Prof. Charles W. The complete herbarium of the late Prof. Charles W. Short, of Louisville, Ky., consisting of more than 6000 species of North American Plants, and 3000 or 4000 European species, enclosed in 300 quarto volumes, besides numerous packages of Tropical Plants. Presented by the family of Prof. Short, through the recommendation of Prof. Asa Gray.

Smithsonian Institution. *Jan. 5th.* Seven species of Strepomatidæ. *March 8th.* Thirty-one specimens, of twenty-eight species of Birds, from the collection of the United States Exploring Expedition, of the Vincennes and Peacock, and two specimens from Europe. Seventy-one species of Marine Mollusca in alcohol, mostly American. Two hundred and eighty-seven species of Shells, mostly American. Sixty-two species Crustacea, mostly from the U. S. Exploring Expedition. Sixteen species of Echinoderms in alcohol. The collection labelled by Dr. Wm. Stimpson. *Apr. 5th.* Three species of Birds, from Mexico. *July 19th.* Twenty-seven specimens of Rocks. *Sept. 20th.* A collection of about one hundred specimens of Birds, from Siam. *Oct. 18th.* Three species of Birds from Madagascar.

Trautwine, J. C. *June 22d.* Pyrolusite, Nova Scotia. Shale with minute Shells, Nova Scotia.

Tryon, George W. Jr. Four species of Strepomatidæ. *March 15th.* Four species of Murex. *Apr. 12th.* Six species of Mollusca. *June 22d.* Twenty-seven species Helix, twenty-eight Partula, two Succinea, one Vitrina, one Testacella, two Bulimus and six Achatinella. *Nov. 15th.* Four species of Cyclostoma, six Cylindrella, four Melampus, one Pupina, Sixteen Clausilia, two Truncatella, seven Pupa, two Physa, one Lymnæa, five Planorbis, two Lithoglyphus, six Bithinia, three Amnicola, one Spiraxis, four Vivapara, twelve Neritina, six Melanopsis.

Vaux, W. S. *Oct. 11th.* A fine specimen of crystallized Brucite, Texas, Lancaster Co., Pa.

Ward, George W. *Jan. 19th.* Large mass of Teredo, from the Marl of Salem Co., N. J.

Wharton, Joseph. *July 12th.* Eighteen Minerals, from Lancaster Co.

Wilson, Dr. Thomas B. *March 22d.* Sixty-five specimens, of thirty-five species of Birds, from Duchaillu's collections in West Africa. *Apr. 5th.* Twenty-three specimens of Birds, from Mr. D'Oca's collections at Jalapa, Mexico. *Apr. 15th.* Two species of Birds, from Port Natal. Sixty-two specimens of Birds, from Mr. Duchaillu's collections in Western Africa. *Oct. 18th.* Twenty specimens of Birds, from Ecuador; fourteen specimens, of seven species of Birds, from Duchaillu's collections in West Africa. Tringa himantopus, Long Island, N. Y.

Wood, Chris. J. *Apr. 5th.* Zonotrichia Pennsylvanica.

Wood, Wm. S. *Apr. 5th.* Two species of Birds.

Wyld, Thos. *July 12th.* Fine specimen of Oreophasis Derbyanus.

Xantus, J. *Sept. 20th.* Specimens of Cuculus canorus, from Hungary.

DONATIONS TO THE LIBRARY.

1864.

JOURNALS AND PERIODICALS.

SWEDEN.

Upsal. Nova Acta Regiæ Societatis Scientiarum Upsaliensis. Seriei Tertiæ, vol. 4, Fasc. 2, and vol. 5, Fasc. 1. 1863—64. From the Society.

DENMARK.

Copenhagen. Oversigt over det K. Danske Videnskabernes Selskabs Forhandlingar og dets Medlemmers Arbeider i Aaret, 1862 and 1863. From the Society.

Videnskabelige Meddelelser fra den Naturhistoriske Forening for Aarets 1849 to 1862. 8 vols., 8vo. 1850—1863. From the Society.

Christiania. Forhandlingar i Videnskabs-Selskabet. Aarets 1858—62. From the Society.

Forhandlingar ved de Skandinaviske Naturforskeres Fjerde und Syvende Möde. 1847—1856. From the Society.

NORWAY.

Drontheim. Det K. Norske Videnskaber Selkabs Skrifter i det 19de Aarhundrede. 1859. From the Society.

RUSSIA.

Moscow. Bulletin de la Société Impériale des Naturalistes de Moscou. Année 1863, Nos. 1 and 2. From the Society.

St. Petersburg. Bulletin de l'Academie Imp. des Sciences. Tome 4, Nos. 8—11. Tome 5, No. 1. From the Society.

Neue Nordische Beytrage zur Physikalischen und Geographischen Erd-und Volkerbeschreibung, Naturgeschichte, &c. 7 vols., 8vo, 1781—1796. From the Library Fund.

HOLLAND.

Amsterdam. Nederlandsch Tijdschrift voor de Dierkunde uitgegeven door het K. Zoologisch, Genootschap Natura Artis Magista. Jahrg. 1, Afl. 1—5. From the Society.

Verslagen en Mededeelingen der K. Akademie van Wettenschappen. Afdeeling Naturkunde. 15e und 16e Deels. Afdeeling letterkunde. 7e Deel. From the Society.

Stockholm. Ofversigt af K. Vetenskaps-Akademiens Forhandlingar Sjuttonde, Adertonde Argangen 1860—62. From the Society.

K. Svenska Vetenskaps-Akademiens Handlingar. Tredje Bandet, Forsta und Andra Haftet and Fjerde Bandet. 1st Haftet. 1862. From the Society.

GERMANY.

Augsburg. Sechzehnter und Siebenzehnter Bericht des Naturhistorischen Verein. 1863. From the Society.

Berlin. Archiv für Naturgeschichte. Von Dr. F. H. Troschel. 29er Jahrg., 2es Heft to 30er Jahrg., 2es Heft. From the Editor.

Zeitschrift der Deutschen Geologischen Gesellschaft. 15 Band, 2es Heft to 16 Band, 2es Heft. From the Society.

Zeitschrift für die Gesammten Naturwissenschaften. Herausgegeben von dem Naturw. Vereine für Sachsen und Thuringen in Halle. Jahrg. 1862, 1863 and Jan., 1864. Berlin. From the Society.

Wochenschrift des Vereins zur Beförderung des Gartenbaues. 6 Jahrg., Nos. 31—51. 7er Jahrg., Nos. 1—30. From the Society.

Physikalische Abhandlungen der K. Akad. der Wissen. Aus dem Jahre 1862. From the Society.

Berliner Entomologische Zeitschrift. 1er Jahrg., 1863, 3es und 4es Heftes. 8es Jahrg., 1es und 2es Heftes. 1863—64. From the Entomological Society of Berlin.

Monatsberichte der K. P. Akademie der Wissenchaften. 1863. From the Society.

Bonn. Verhandlungen des Naturhistorischen Vereines der Preussischen Rheinlande und Westphalens. 20er Jahrg., 1863. From the Society.

Brünn. Eilfter und 12er Jahres über die Wirksamkeit des Werners-Vereins. 1861—62. From the Society.

Verhandlungen des Natursforschenden Vereines. 1 Band, 1862. From the Society.

Cassel. Journal für Ornithologie. Hefts 1—6, 11 Jahrg. From the Library Fund.

Malakozoologische Blätter. Bands 9 und 10. From the Library Fund.

Darmstadt. Notizblatt des Vereins für Erdkunde und verwandte Wissenschaften. III. Folge, 2 Heft, Nos. 13—24. 1863. From the Society.

Dresden. Verhandlungen der K. Leop. Carol. Deutschen Akademie der Naturforscher. 3er Band. 1864. From the Society.

Sitzungs-berichte der Naturwissenchaftliche Gesselschaft Isis, 1863. From the Society.

Emden. Achtundvierzigster Jahresbericht der Naturforschenden Gesellschaft. 1862. From the Society.

Frankfurt-am-Main. Der Zoologische Garten. Nos. 7—12, 4 Jahrg. No. 1, 5 Jahrg. From the Editor.

Abhandlungen; herausgegeben von der Senckenbergischen Naturforschenden Gesellschaft. 14 Bandes, 3e und 4e Lief. 1863. From the Society.

Freiburg. Berichte über die Verhandlungen der Naturforschenden Gesellschaft. Band 3, Heft 1. 1863. From the Society.

Giessen. Zehnter Bericht der Oberhessischen Gesellschaft für Natur- und Heilkunde. Giessen, 1863. From the Society.

Göttingen. Nachrichten von der Georg-Augusts-Universität. Jahrg., 1863, Nr. 1—21. From the University.

Halle. Abhandlungen der Naturforschenden Gesselschaft zu Halle. 8en Bandes, 1es und 2es Heftes. 1864. From the Society.

Der Naturforscher. 30 parts in 15 vols., 8vo. Halle, 1774—1802. From the Library Fund.

Hamburg. Abhandlungen aus dem Gebiete der Naturwissenschaften herausgegeben von dem Naturwissenchaftliche Verein. 1862. From the Society.

Hannover. Dreizehnter Jahresbericht der Naturhistorischen Gesellschaft zu Hannover. 1863. From the Society.

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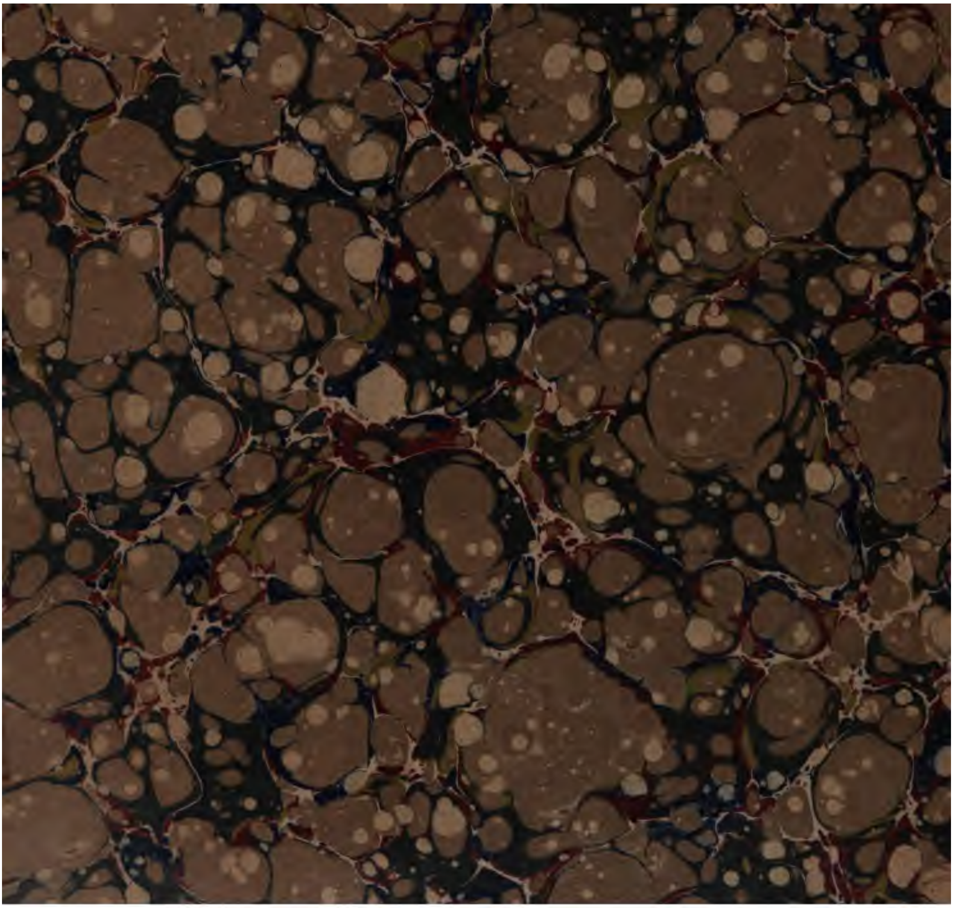

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